FIELD ACTIVITIES REPORT

LEEDS SILVER RECLAMATION SITE

Washington County, Utah
UTD981550619

Utah Department of Health
Bureau of Environmental Response and Remediation
Prepared By: Jason L. Knowlton

Draft 12/17/90
Revised 3/7/91

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1.0 INTRODUCTION

The Leeds Silver Reclamation Site (UTD981550619), located approximately one mile northwest of Leeds, Utah in the Silver Reef Mining District, is an inoperative ore processing facility which utilized an acid heap leach process for the extraction of copper and silver. Sampling was conducted at this site by the Utah Bureau of Environmental Response and Remediation (UBERR) on July 31 and August 1, 1990. A Sampling Plan, dated May 11, 1990, was prepared for the site which outlined the procedures to be followed for sampling this site. This report outlines the procedures which were actually used for the sampling of the Leeds Silver Reclamation Site and documents any deviations from the plan.

The sampling activities were undertaken as part of a Screening Site Investigation under authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). UBERR conducts these activities under agreement with the U.S. Environmental Protection Agency (EPA). The information obtained will be used for purposes of scoring the site according to the Hazard Ranking System (HRS) of the National Oil and Hazardous Substance Pollution Contingency Plan (NCP).

The scope of sampling activities involved the collection of 6 sediment samples, 4 soil samples, 5 surface water samples, and 2 ground water samples, for a total of 17 samples, including all quality control samples.

The objectives of sampling, as stated in the Sampling Plan, were as follows:

- The ore materials deposited on the leach pad will be characterized to determine whether they present a significant hazard from the on-site exposure pathway and whether hazardous materials on the pad may potentially become windborne and migrate off-site via the air migration pathway.

- Sediments and surface water in three pond areas will be characterized to further assess the on-site exposure hazards and to determine the hazardous nature of leachates in the water which may potentially migrate off-site via the surface and ground water migration pathways.

- Field observations of the drainage basin will be made with regard to topography to determine if surface water can migrate off-site and into Quail Creek approximately 3 miles downstream.

- An existing water well near the south edge of the site and presumably downgradient to the site will be sampled to determine if hazardous constituents from the site have contaminated this water supply. Other information needed to assess the potential for contamination of the ground water migration pathway will be obtained.

- Other location specific information, such as demographic analysis and water use survey, needed to effectively score the site under the revised HRS will be obtained during the sampling event. Waste characteristics, especially waste quantity and waste containment, will be evaluated for each waste source.

These objectives were attained during the sampling event.

The sampling team consisted of the following UBERR personnel:

Jason Knowlton	Project Manager
Robert O'Brien	Sampler

2.0 BACKGROUND

Background information about the site was obtained from CERCLA files at UBERR, permit and reclamation files at the Utah Division of Oil, Gas and Mining (DOGM), personal communication with the property owner, and from publications of the Utah Division of Water Resources and the Utah Geological and Mineralogical Survey.

2.1 LOCATION AND DESCRIPTION

The Leeds Silver Reclamation Site is located at the North 1/4 Corner of Section 12, Township 41 South, Range 14 West, Salt Lake Baseline and Meridian in Washington County, Utah. Leeds, Utah (population 260) is approximately one mile southeast of the site along the east side of Interstate 15. The small town of Silver Reef (population approximately 150) is located about one mile north of the site. A few rural residences are located to the east and south of the site within a four mile radius and plans have been made for a housing development about 1/2 mile south of the site. Figure 1 is a Site Location map.

A large heap leach pad covers 3.8 acres near the center of the site. At the south end of the leach pad is a small collection pond and south of this is an overflow pond. These two ponds cover 0.9 acres. The leach pad and both of these ponds are underlain by an asphalt liner. A levee extends partway across the drainage to the south of the overflow pond forming a secondary surface water impoundment to contain the runoff from the site should the other ponds overflow. North of the leach pad is a 1.3 acre ore stockpile and south of this stockpile, about half the distance to the leach pad, are three 72-gallon electrical transformers. The mill area covers 0.5 acres in the southwest corner of the site.

2.2 SITE HISTORY

The site is currently owned, and was operated, by 5M, Inc. of Hurricane, Utah. Jerry Glazier is the President and owner of the company. The asphalt leach pad and ponds were constructed around 1978 and the facility was in operation through 1983. Copper and silver sandstone ores from the Triassic Silver Reef Member of the Chinle Formation were

processed via acid heap leach operations. 5M, Inc. had proposed a uranium and vanadium recovery operation in addition to the copper and silver but the necessary permits from the Nuclear Regulatory Commission were never obtained and the processes never came into operation.

The Utah Division of Oil, Gas and Mining has been regulating activities at the site since operations commenced in 1978. 5M's compliance with DOGM has not always been satisfactory and DOGM is currently seeking a $46,000 reclamation surety bond from 5M. DOGM is conducting a hazard assessment of open mine shafts and adits with a $55,000 forfeited bond from Kerley Industries, a company which once had prospects of a joint venture with 5M, Inc. 5M has expressed intentions to resume operations at the site should the price of silver become sufficiently high.

A developer with prospective properties south of the site has alleged that constituents from the site may have migrated to the groundwater and contaminated his well located less than 1/4 mile downgradient of the site. He intends to use this well as a public supply for culinary water for a planned 90 family subdivision to be located immediately south of the site. Water from this well is currently used for domestic supply for approximately 11 residences.

2.3 PREVIOUS WORK

Water samples taken by Utah Department of Health and 5M representatives on November 21, 1986 from the collection pond and overflow pond and analyzed for metals show detectable concentrations for 10 constituents. These constituents include: Barium, 2.0 mg/L; Cadmium, 1.06 mg/L; Iron, 180 mg/L; Manganese, 126 mg/L; Chloride, 975 mg/L; Sulfate, 220,000 mg/L; Copper, 222 mg/L; Mercury, 0.374 mg/L; Silver, 8.8 mg/L; and Zinc, 109 mg/L.

A Preliminary Assessment conducted by the UBSHW indicated a potential for contamination of soils, ground water and surface water and assigned the site a medium priority for further site investigation activities.

3.0 FIELD ACTIVITIES

Sampling commenced on July 31, 1990 and continued for 2 days. The weather was hot and dry with highs of about 105 degrees Farenheit and winds from the south at about 10 to 15 miles per hour. Coordination with the contract laboratory, landowners and local health authorities was made by the Project Manager prior to going on-site. Provisions for site access were arranged on July 31, and the landowner and well owner were notified of their right to obtain split-samples, which they refused. Signed Consent for Access to Property forms are included as Attachment A.

3.1 SAMPLE COLLECTION

Four soil, 6 sediment, 5 surface water and 2 ground water samples were collected. Table 1 summarizes the sample locations and briefly describes the sampled material. Figure 2 shows the locations of all samples. Sampling was conducted in accordance with methods outlined in the UBERR CERCLA Quality Assurance Project Plan (QAPP) of November, 1989. An adequate quantity of previously decontaminated sampling equipment was supplied in order to avoid the need for field decontamination.

Because of the possibility that uranium ores may have been placed in the leach pad, the entire site was screened for radioactive emissions on December 14, 1989 by representatives from the Utah Bureau of Radiation Control (BRC). Memos describing the site visit for radioactive screening are included as Attachment B.

Samples obtained from all media were sent to CHEMTECH Laboratory for analysis of total metals. Duplicates of all samples were sent to the Utah State Health Laboratory for analysis of gross alpha and gross beta radiation, and sulfide.

Photographs were taken throughout the sampling event to help document the sample locations and the sampling methods. These photographs are included in Attachment C.

3.1.1 GROUND WATER

An existing well located approximately 300 feet south of the site, and presumably downgradient, was sampled to determine whether this water is contaminated from constituents originating on-site. Well construction information, water level data and a geologic log of the drill hole was obtained from the well owner on July 30, 1990. This information is presented in Attachment D. The minimum purge volume of 1723 gallons, corresponding to 3 well casing volumes of water, was determined prior to sampling. Mr. LaVarr Webb, representative for the well owner, accompanied us to the site and turned on the pump, which was operated for a period of 60 minutes prior to sample collection. Mr. Webb indicated that the pump yielded approximately 85 gallons per minute. Purge water was collected in a large storage tank located on a hill about a mile south of the site.

Ground water sample LS-GW-01 was obtained from a spigot located directly atop the well casing. Approximately 9 well casing volumes of water were purged prior to sample collection to insure that the water collected for the sample was representative of that in the aquifer and to reduce any influence that the casing and pump may have on the chemical quality. Measurements of the pH, temperature, and specific conductivity were taken immediately prior to sampling and are listed in Table 2. It is not known whether these field parameters had stabilized. The ground water sample for metals analysis was filtered in the field with a 0.45 micron filter membrane and preserved with nitric acid to a pH of less than 2.

Quality assurance sample LS-GW-02, a trip blank, was collected from a container of deionized water immediately following the collection of the ground water sample.

3.1.2 SURFACE WATER AND SEDIMENT

Runoff at the site is ponded in either the acidic water collection pond at the south end of the leach pad or the overflow reservoir. Both of these ponds are underlain with an asphalt and bentonite containment system. Immediately south of the mill area is an unlined secondary impoundment. Farther down-drainage is a stockwatering pond. A canal originating in Leeds Creek about 2 miles north runs along the east side of the site and feeds this pond which is currently used for irrigation.

The drainage area upstream from the site encompasses less than one square mile and the topography suggests that the drainage basin downstream from the site may be closed. Thus, most of the runoff in this drainage is ponded on or near the site and only during the most torrential precipitation events would potentially contaminated surface waters have a possibility of migrating out of the basin.

Surface water samples were collected directly into appropriate containers by submersing the container into the water. Temperature, pH and specific conductivity were measured in the field at all surface water sample locations. The results are presented in Table 3.

Sediments were collected either by scooping the bottom material directly into the appropriate containers, or by collecting the material with a stainless steel spoon and transferring it into the appropriate container. The sediment samples were collected at all surface water sample locations after the surface water samples were procured.

A description of the sample locations follows:

Samples LS-SW-01 and LS-SE-01 were collected from the asphalt lined collection pond. The water had a lime-green viscous "syrupy" appearance with very small prismatic crystals in suspension. A green crystalline crust was present on the surface of the water and gray-brown sediments covered the bottom and outer fringes of the pond. The surface water sample was collected in double volume to provide for an internal laboratory quality assurance check. The sediment sample was a composite of the green crystalline crust, the gray-brown outer fringe and the underwater sediments.

Samples LS-SW-02, LS-SE-02, LS-SW-04 and LS-SE-04 were collected in duplicate from the south side of the asphalt lined overflow pond. The water was clear and approximately 6 to 8 inches deep. Two partially full and 1 empty 55 gallon drums were present near the bottom of the pond. The sediments were very-fine-grained with a red-brown layer at the surface, a light-green layer from 1 to 1 1/2 inch, and dark-brown below.

Sample LS-SE-03 was collected at the lowest part of the northern portion of the secondary impoundment. No surface water was present in the secondary impoundment at the time of sampling. The sediment consisted of a red-brown sandy silt with an alkali surface and was slightly moist below 1 inch. The sample was collected at a depth of 1 to 3 inches. Vegetation was very sparse within the impoundment as compared to the off-site vegetated ground.

Samples LS-SW-05 and LS-SE-05 were collected downstream of the site and the secondary impoundment from a ditch which flows along the east and south borders of the site and empties into the stockwater pond. Water in the ditch is apparently diverted from Leeds Creek, which is located to the north of the site. Flow in the ditch is intermittent, depending on whether the diversion gates are open. The water was clear and the banks of the ditch were well vegetated.

Samples LS-SW-06 and LS-SE-06 were collected from the ditch where it flows on top of a hill to the northeast of the site. The water was clear and the banks of the ditch were well vegetated. These samples will be used as background samples.

3.1.4 SOIL

Soil samples were collected with a stainless steel spoon at or near the ground surface and placed directly into the appropriate containers listed in Table 3. Two of the four soil samples were collected from the surface of the leach pad. One was collected from the ore stockpile and one background sample was taken off-site to the north for use as background. Sample descriptions follow:

Sample LS-SO-01 was collected about 250 feet north of the ore stockpile and the north end of the site to determine background concentrations of potential contaminants. The sample was collected at a depth of 1 to 3 inches and consisted of a red-brown pebbly silt from 0 to 2 inches underlain by green-gray silty clay. Buff to white sandstone bedrock was present in the vicinity of the sample location.

Sample LS-SO-02 was collected at the surface from the east side of the ore stockpile and consisted of light-gray-brown fine sand and silt.

Sample LS-SO-03 was collected at a depth of 0 to 3 inches from the northeast corner of the leach pad. Gray sand and pebbles covered the surface and graded to a purple at a 1 inch depth and red-brown to yellow-brown from 1 to 3 inches.

Sample LS-SO-04 was collected from the south end of the leach pad at a depth of 1 to 3 inches. The material was brown silty sand with minor white alkali crust.

3.2 QUALITY CONTROL

Samples were handled and preserved as per UBERR QAPP of November, 1989, QA/QC criteria. All samples for metals analysis were cooled with ice to 4 degrees Celsius. Water samples for metals analysis were preserved with nitric acid to a pH less than 2. Radiation samples were not preserved.

3.2.1 SAMPLE CONTAINERS

Only certified CLP sample containers were used. The appropriate sample containers for each specific media and respective analyses are listed in Table 4. The containers were provided by I-Chem Research and Eagle-Picher.

3.2.2 BACKGROUND SAMPLES

Three background samples were collected. Sample LS-SO-01 is a background soil sample collected from the north portion of the site. Sediment and surface water samples, LS-SE-06 and LS-SW-06, were collected from the ditch, upstream and northeast of the site.

3.2.3 INSTRUMENT CALIBRATION

All instuments were calibrated according to manufacturers instructions at the start of sampling and periodically through the sampling event. Field monitoring and analytical equipment consisted of a conductivity meter and a pH/temperature meter.

3.2.4 QA/QC SAMPLES

Trip Blank - Sample LS-GW-02. A carbon-filtered deionized water sample was prepared immediately after collecting the first sample, LS-GW-01, which traveled with the other samples and was treated and analyzed as a normal ground water sample. This sample will assess whether the sample containers, preservatives or field conditions are adding to the contamination levels of all samples.

Duplicates - Samples LS-SW-04 and LS-SE-04. Two duplicate samples were made as similar as possible to the originals, LS-SW-02 and LS-SE-02, by systematically alternating the containers during sample collection. These samples will provide an external laboratory QA check.

Double Volume Inorganic - Sample LS-SW-01. One double volume surface water sample for metals analysis was collected for the CLP contract lab internal QA procedures.

3.3 DOCUMENTATION

Documentation procedures included the completion of all CLP forms and tags for RAS inorganic analyses, and State Health Laboratory forms and tags for radiation and sulfide analyses. Strict Chain of Custody was maintained and Chain of Custody forms were filled out to accompany each shipment. These forms are included in Attachment E. Samples for metals analysis were shipped on August 2, 1990 by Airborne Express to CHEMTECH Consulting Group laboratory. Samples for radiation analysis were hand delivered to the Utah State Health Laboratory on August 2, 1990.

4.0 FIELD OBSERVATIONS

In addition to the sampling described above, efforts were made to characterize the potential human and enviromental receptors. For the ground water pathway, the maximally exposed individual (MEI) is located less than 1/4 mile to the south. This well serves 11 households with a total population of 69 persons. The MEI for the air pathway is a private residence located approximately 1/4 mile to the south. The populations within each of the 1/4, 1/2, 1, 2, 3, and 4 mile target distance limits will be determined prior to the drafting of an Analytical Results Report. No restrictions to access existed at the time of sampling this site, and evidence of observed use, such as off-road-vehicle tracks and vandalism of the structures, was apparent on-site.

A visual inspection of the surface water pathway did not reveal any apparent outlet for overland flow from the site. Numerous man-made "levees" cross the natural drainage basin in many areas and appear to confine runoff to within 1000 feet of the site, and well upstream of any potential human or environmental targets. However, an overland flow pathway was present for materials to migrate from the leach pad to the local, adjacent basin and into the ditch which feeds the stockwater pond. Sediments showing flow characteristics, and apparently derived from the leach pad, were present along this flow route.

5.0 REFERENCES

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Stevens, Dale J., R. Clayton Brough, Rodney D. Griffin and E. Arlo Anderson. 1983. Utah Weather Guide.

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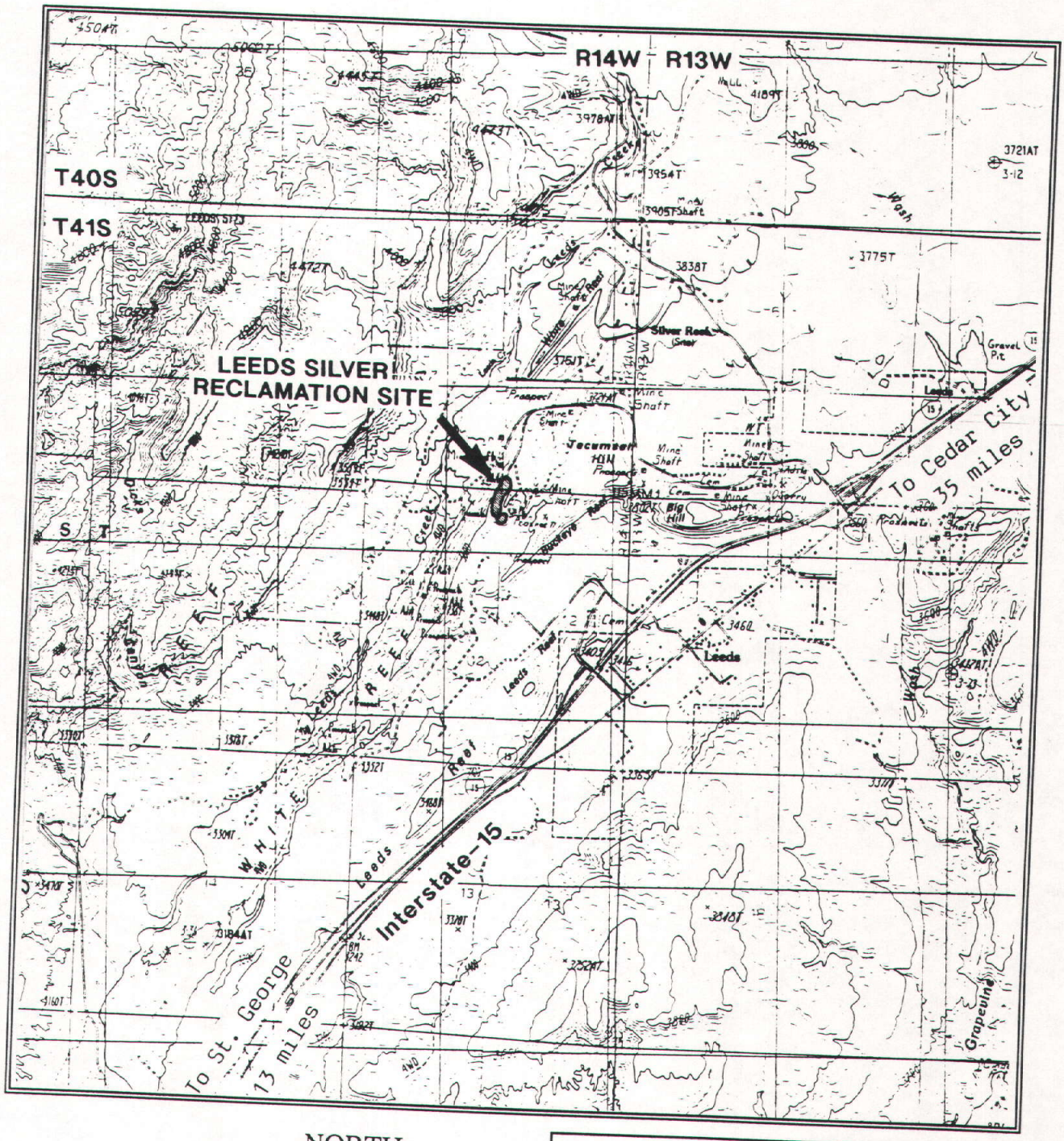
Webb, La Varr, Hidden Valley Water Users Association. 1990. Personal Communication.



NORTH

USGS Topo. Base, Hurricane, Harrisburg Junction, Signal Peak, and Pintura Quads. 7.5 Min. Series.

UTAH DEPARTMENT OF HEALTH

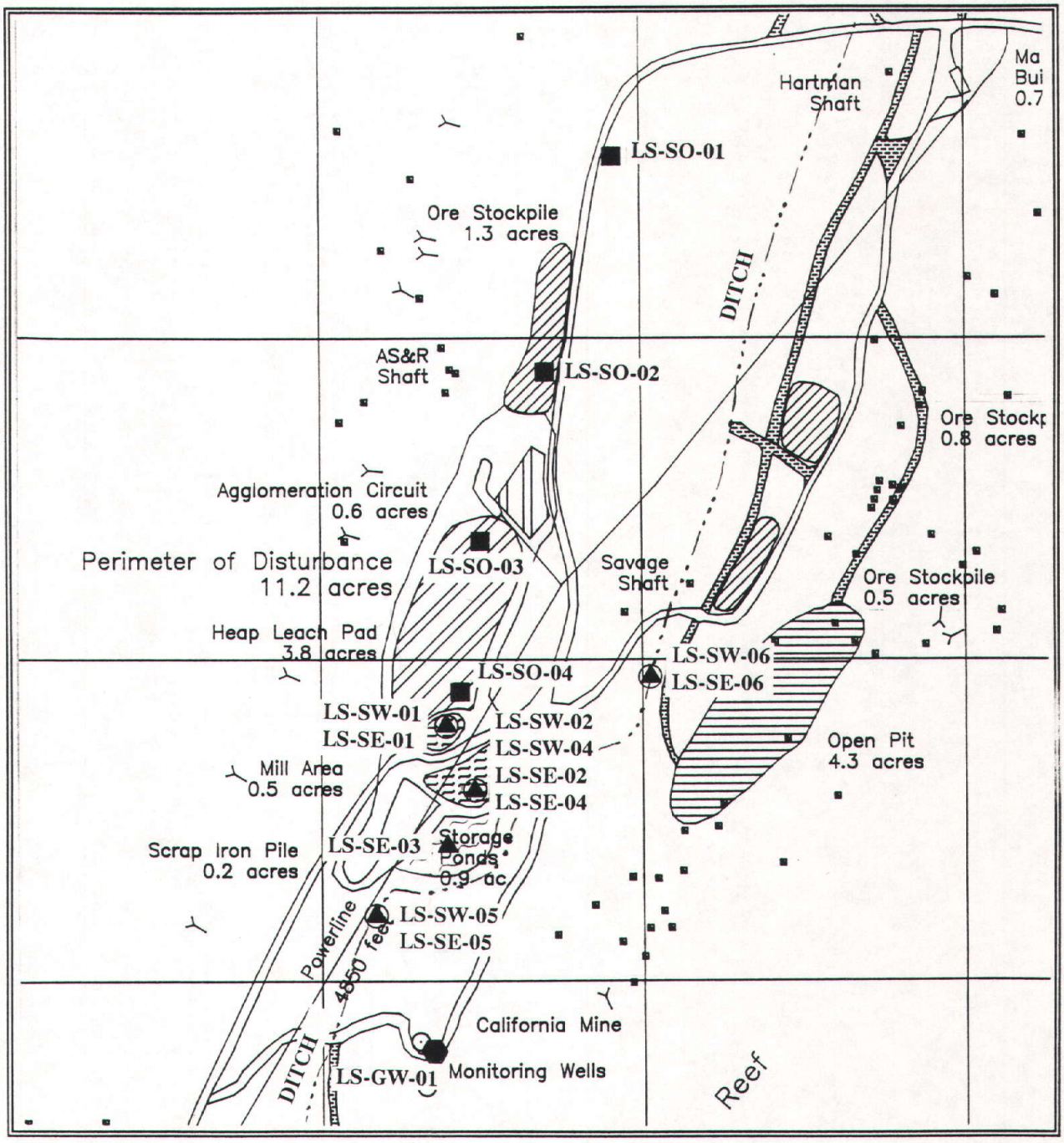
BUREAU OF ENVIRONMENTAL RESPONSE AND REMEDIATION

Figure 1

SITE LOCATION

Leeds Silver Reclamation Site
Washington County, Utah

By	Date	Scale
JLK	11/05/90	approx. 1:36,000



NORTH

■ = Soil Sample

▲ = Sediment Sample

○ = Surface Water Sample

⬢ = Ground Water Sample

Source: Utah Division of Oil, Gas and Mining, SM, Inc. File

UTAH DEPARTMENT OF HEALTH

BUREAU OF ENVIRONMENTAL RESPONSE AND REMEDIATION

Figure 2

SAMPLE LOCATION

Leeds Silver Reclamation Site
Washington County, Utah

By	Date	Scale
JLK	11/05/90	1:6000

Table 1
SAMPLE SUMMARY

Sample #	Location	Description
LS-SO-01	North portion of site - Background	Red-brown pebbly-silt underlain by green-gray silty-clay.
LS-SO-02	Ore stockpile	Light-gray-brown fine-sand and silt.
LS-SO-03	Northeast tailings pile	Gray sand and pebbles grading to purple underlain by red-brown to yellow-brown with minor green.
LS-SO-04	South tailings pile	Brown silty-sand with minor white alkali crust.
LS-SE-01	Collection pond	Green crystalline material and gray-brown mud.
LS-SE-02	Overflow pond	Brown to red mud with a light-green layer underlain by dark-brown mud.
LS-SE-03	Secondary impoundment	Red-brown sandy-silt with white alkali surface.
LS-SE-04	Overflow pond - Duplicate	Same as LS-SE-02
LS-SE-05	Downstream in ditch	
LS-SE-06	Upstream in ditch - Background	
LS-SW-01	Collection pond	Viscous lime-green water with small suspended prismatic crystals, approx. 1 inch deep
LS-SW-02	Overflow pond	Clear water, 6 to 8 inches deep
LS-SW-04	Overflow pond - Duplicate	Same as LS-SW-02
LS-SW-05	Downstream in ditch	Clear water
LS-SW-06	Upstream in ditch - Background	Clear water
LS-GW-01	Existing well southeast of site	Clear water
LS-GW-02	Trip Blank	Carbon-filtered deionized water

Table 2
FIELD MEASUREMENTS FOR WATER SAMPLES

LS-GW-01 Existing well, sampled 7/31/90

Time	Temperature (degrees C)	pH	Specific Conductivity (micro mhos)
11:05	17.7	7.37	1030

LS-SW-01 Collectionpond, sampled 7/31/90

Time	Temperature (degrees C)	pH	Specific Conductivity (micro mhos)
14:00	36.3	2.63	185,700

LS-SW-02 Overflowpond, sampled 7/31/90

Time	Temperature (degrees C)	pH	Specific Conductivity (micro mhos)
14:30	32.8	7.43	13,580

LS-SW-05 Downstream ditch, sampled 8/01/90

Time	Temperature (degrees C)	pH	Specific Conductivity (micro mhos)
08:00	19.9	8.24	300

LS-SW-06 Upstreamditch, sampled 8/01/90

Time	Temperature (degrees C)	pH	Specific Conductivity (micro mhos)
08:30	18.7	8.53	220

TABLE 3

APPROPRIATE SAMPLE CONTAINERS FOR
SPECIFIC SAMPLING MEDIA AND ANALYTICAL PARAMETERS

1.	Surface water or ground water samples	
	Total metals --	1 one liter plastic bottle
	Radiation --	1 eight oz. glass bottle per sample
2.	Solids (soil, sediment, etc.)	
	Total Metals --	1 eight oz. glass bottle per sample
	Radiation --	1 eight oz. glass bottle per sample

ATTACHMENT A
Signed Consent for
Access to Property Forms

Utah Bureau of Solid & Hazardous Waste
CERCLA Branch

CONSENT FOR ACCESS TO PROPERTY

Name, Title Don Larkin, Hidden Valley Water Users Assoc.

Address or Coordinates of Property Underground Water Well located in Sec. 12, T41S, R14W

I consent to officers, employees, and authorized representatives of the Utah Bureau of Solid & Hazardous Waste (BSHW) entering and having access to my property for the following purposes:

1. The taking of ground water samples;
2. Other such actions related to the taking of these samples as may be necessary.

I realize that these actions by BSHW are undertaken pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (Superfund), 42 U.S.C. c9601-9675.

This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind.

Donald Larkin
(Signature)

July 30, 1990
(Date)

Utah Bureau of Solid & Hazardous Waste
CERCLA Branch

CONSENT FOR ACCESS TO PROPERTY

Name, Title Jerry Glazier, 5M Inc.

Address or Coordinates of Property Leeds Silver Reclamation Site
(Silver Reef)
N¼ Corner, Section 12, T41S, R14W

I consent to officers, employees, and authorized representatives of the Utah Bureau of Solid & Hazardous Waste (BSHW) entering and having access to my property for the following purposes:

1. The taking of 6 soil, 4 sediment, and 4 surface water samples;

2. Other such actions related to the taking of these samples as may be necessary.

I realize that these actions by BSHW are undertaken pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (Superfund), 42 U.S.C. c9601-9675.

This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind.

5M, Inc
By Jerry Glazier
(Signature)

7/31/90
(Date)

5M, INC., P.O. BOX 752, HURRICANE, UTAH 84737 (801) 635-4473

LIABILITY RELEASE

For Injury to Person and/or Damage to Equipment

The undersigned hereby agrees not to hold 5M., Inc., responsible for any injury to person and/or damages to property or equipment sustained while traversing patented or unpatented mining properties belonging to 5M, Inc., in the Leeds/Silver Reef mining area.

Utah BSHW — Company Represented

Signed — 7/31/90

7/31/90

Witness

7/31/90 — Dated

(File in duplicate)

ATTACHMENT B
Site Visit Memos
Radiation Screening

MEMORANDUM

DEC 1 3 1989

TO:: Leeds Silver Reclamation Site file
(UTD No. 981550619)

FROM: Jason Knowlton, Project Manager JLK

THROUGH: Brad T. Johnson, Technical Services Manager
Bureau of Solid & Hazardous Waste

SUBJECT: Site visit, December 14, 1989

John Hultquist, Utah Bureau of Radiation Control (BRC), and I inspected the Leeds Silver Reclamation Site on December 14, 1989. The primary purpose of the visit was to determine whether radioactive emissions from the site were at levels significantly above background or which could present a risk to human health or the environment. Subsidiary purposes of this visit were to assess the potential for migration of contaminants off-site, especially with regard to the surface water pathway, and to better familiarize myself with the site and with the problems associated with the site.

At 9:00 am, I met with Jerry Glazier of 5M, Inc. at their office in the basement of the Zion's Bank Building (279 South State) in Hurricane, Utah to obtain access to the site. Conversation with Mr. Glazier indicated that a conflict exists between 5M, Inc. and a local land developer, LaVar Webb, who wishes to develop land immediately southeast of the 5M Silver Reef property for residential use. Mr. Webb is concerned that materials from the 5M property may have contaminated the groundwater in the area. Mr. Glazier claims that the current water table is the result of recent water diversion activities and that in the past, the water table was at depths greater than 300 feet below land surface. He claims that no pumping of water was done in conjunction with the historic mining operations in the shafts and tunnels extending to these depths. Water in a canal to the north of the site is diverted down the California Shaft near the site. Mr. Glazier alleges the the water for LaVar Webb's drinking water supply is being pumped at depth from the lateral workings of the California Mine and not from a bedrock aquifer.

I arrived at Leeds, Utah at 10:00 am accompanied by Mr. Glazier, and met with John Hultquist. Mr. Glazier unlocked and opened the gate providing us access to the site from the north. After describing the site briefly, Mr. Glazier left at about 11:00 am. The weather was clear and cool with moderate, gusty winds.

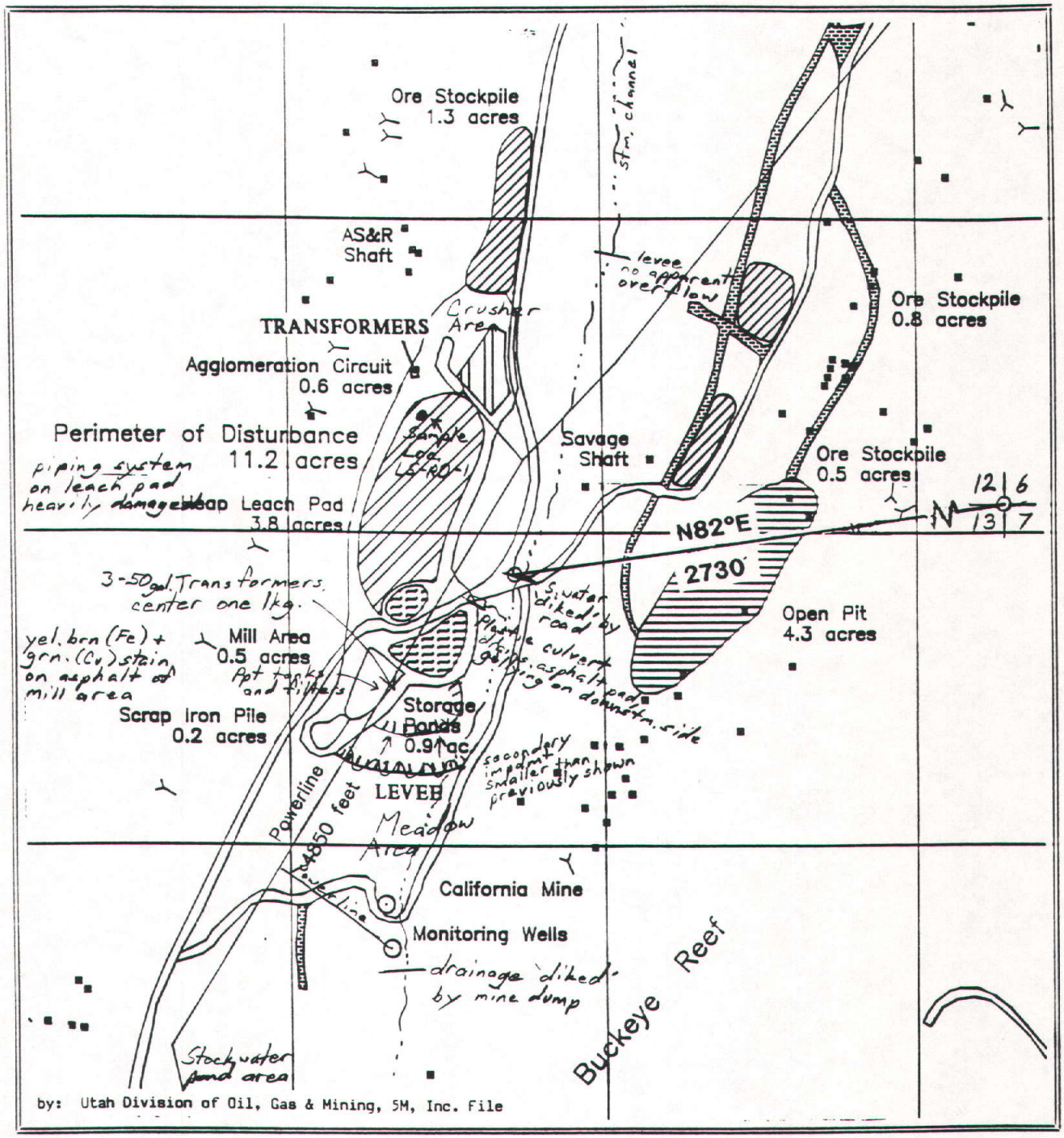
John Hultquist scanned the site with a portable radiation detector. No areas were located with radiation levels which were substantially above background or which presented a

significant hazard. The highest reading obtained was approximately twice the background level and was located on top of the leach pad near the north end of the pad. A soil sample (#LS-RD-1) was taken from this location and will be analyzed for radioactive emissions by BRC. John Hultquist will send BSHW a memo summarizing the results of the radiation survey.

Observations were made of the drainage basin with regard to topography and the potential for contaminants to migrate off-site via the surface water pathway. The valley bottom trends roughly north-south along the east side of the site. Mine tailings and levees truncate the valley floor in several locations near the site forming impoundments which appear sufficient to contain all overland flow originating on-site and upstream to the site and confine it to within a quarter-mile downstream. Material from the leach pad appears to have overtopped a berm on the east side of the pad and may be migrating into a valley meadow adjacent to and southeast of the overflow pond. Both the overflow and collection ponds were nearly dry. No evidence was apparent which would indicate any past overtopping of these ponds. No drainage structures were apparent connecting the overflow pond to the secondary impoundment. Instead, it appears that the secondary impoundment was designed to capture runoff from the mill area.

Other miscellaneous observations made while onsite include the following: Four houses were visible to the north about a half mile away. Five houses are located about a half-mile southeast of the site. The 72 gallon transformers to the north showed no apparent leakage. Three 50 gallon transformers, one of which appeared to be leaking, were located in the mill area. Green copper precipitate was present in the bottom of some large rectangular 'tubs' in the mill area and in spills on the asphalt of the mill area. The site was strewn with debris and a large amount of vandalism was apparent. These and other observations are noted on the attached site sketch. At 1:00 pm, we left the site and locked the gate behind us.

Figure 2



NORTH

UTAH DEPT. OF HEALTH
Bureau of Solid and Hazardous Waste

Site Sketch

LEEDS SILVER RECLAMATION SITE
WASHINGTON COUNTY, UTAH

by	date	SCALE
JLK	10/10/89	1:6000

DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

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Governor
Suzanne Dandoy, M.D., M.P.H.
Executive Director
Kenneth L. Alkema
Director

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Salt Lake City, Utah 84116-0690
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Memorandum

To: Jason L. Knowlton
Bureau of Solid & Hazardous Waste

From: John Hultquist
Bureau of Radiation Control

Date: December 21, 1989

Subject: Leeds Silver Reclamation Site

On December 14, 1989, I conducted a radiological survey of the Leeds Silver Reclamation Site. A walk-over gamma survey was conducted using a Ludlum 12 S Micro R Meter (S/N 4298). Slightly elevated measurements were observed on the north end of the heap leach pad. The measurements were 35 to 40 micro-rad/hr at approximately one meter above ground level. The measurements were observed approximately 100 feet south from the north end of the leach pad. The area is approximately 8 feet by 25 feet, running in a west-to-east direction, becoming smaller in size as one moves eastward.

All other observed measurements were between 14-20 micro-rad/hr. A one-mile remote measurement was taken to determine a background level. The observed measurement was 15 micro-rad/hr one meter above ground level.

A surface grab sample was taken from the heap leach pad, 40 feet from the west end and 100 feet south of the north end. The sample will be analyzed for Ra-226 and U-238 concentrations.

In summary, the gamma emission coming from the heap leach pad does not warrant concern at this time. If results from the soil analyses indicate high concentrations, then additional surveys will be conducted.

If you have any further questions, please contact me at 538-6734.

DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

Norman H. Bangerter
Governor
Suzanne Dandoy, M.D., M.P.H.
Executive Director
Kenneth L. Alkema
Director

288 North 1460 West
P.O. Box 16690
Salt Lake City, Utah 84116-0690
(801) 538-6121

Memorandum

To: Jason L. Knowlton
Bureau of Solid & Hazardous Waste

From: John Hultquist
Bureau of Radiation Control

Date: April 6, 1990

Subject: Leeds Silver Reclamation Site

Enclosed are the results of the soil sample taken from the heap leach pad. The concentrations reported do not exceed regulated quantities. You may keep the results; I have made a copy for my records.

If you have any questions regarding this matter, please call me at 538-6734.

LEEDS SILVER RECLAMATION SITE:LEACH PAD
BUREAU OF RAD CONTROL

538-6734

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: LEEDS SILVER RECLAMATION SITE:LEACH PAD
Site ID: Source: 00
Cost Code: 342
Lab Number: 8908466 Type: 50
Sample Date: 89/12/14 Time: 12:20
Tot. Cations:
Tot. Anions: me/l Cations:
Grand Total: me/l Anions:

Date of Review and QA Validation
Inorganic Review: 90/03/22
Organic Review:
Radiochemistry Review: 90/03/22
Microbiology Review:

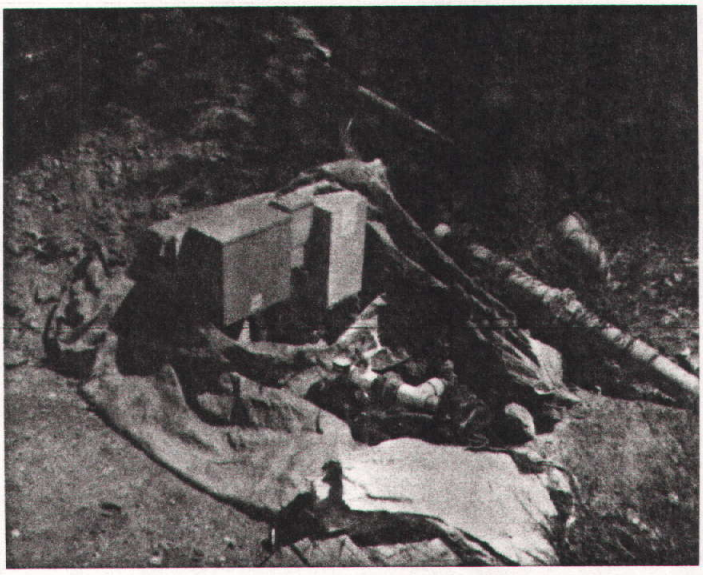
Laboratory Analyses

Uranium	98.0 pCi/g	+/-4.0	Alpha, grs	6 pCi/g	+/-1
Beta gross	6 pCi/g	+/-1.0	226 Radium	8 pCi/g	+/-1

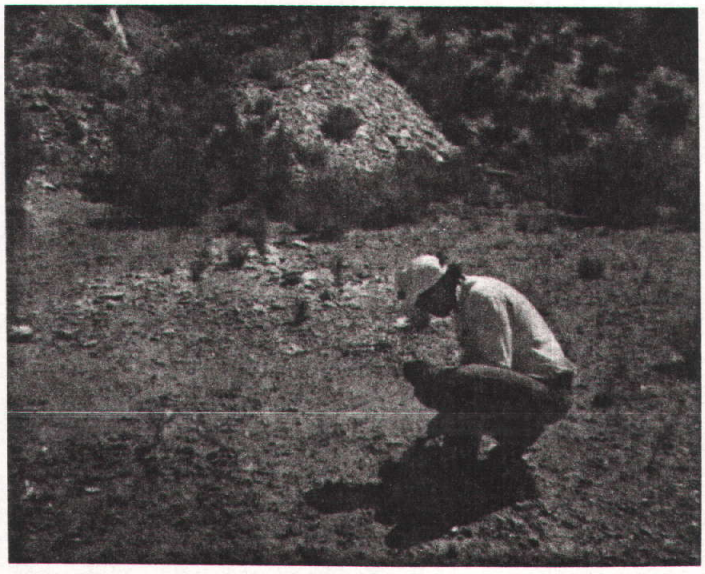
ATTACHMENT C
Site Photographs

#1 Leeds Silver Reclamation Site 7/31/90
Monitoring equipment for water samples. Conductivity meter, pH and temperature meter, and filter apparatus.

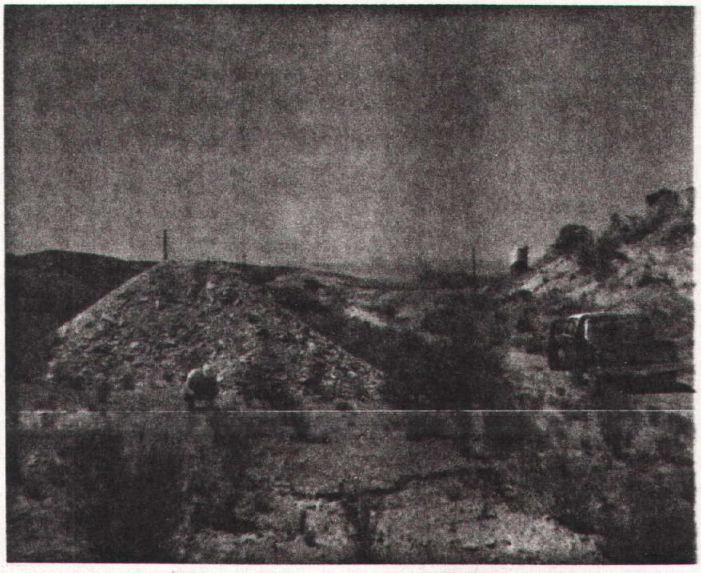
#2 Leeds Silver Reclamation Site 7/31/90
Wellhead at LS-GW-01. Water is pumped to a supply tank located about 1 mile south.



#3 Leeds Silver Reclamation Site 7/31/90
View northeast toward LS-SO-01. Sample is being collected with a stainless steel spoon.

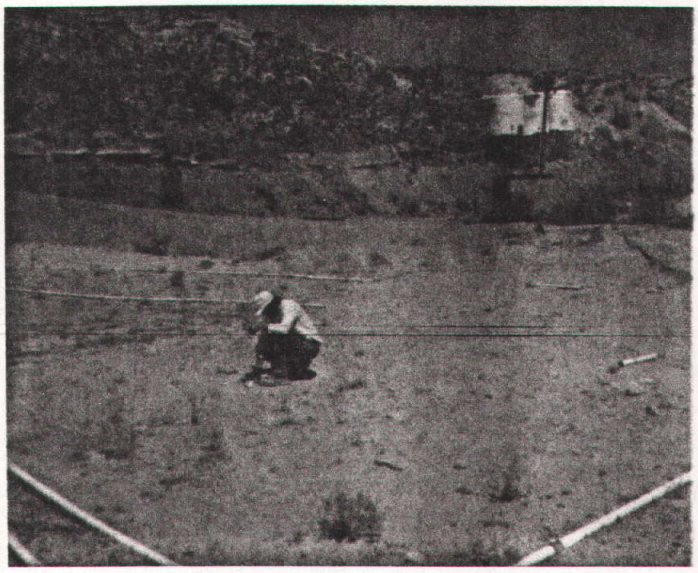


#4 Leeds Silver Reclamation Site 7/31/90
View south toward LS-SO-01. Small pile in background is outcrop. Note ore stockpile to far right.



#5 Leeds Silver Reclamation Site 7/31/90
View south of southwest toward LS-SO-02 located on side of ore stockpile.

#6 Leeds Silver Reclamation Site 7/31/90
View northwest toward LS-SO-03 located on north portion of tailings pile.



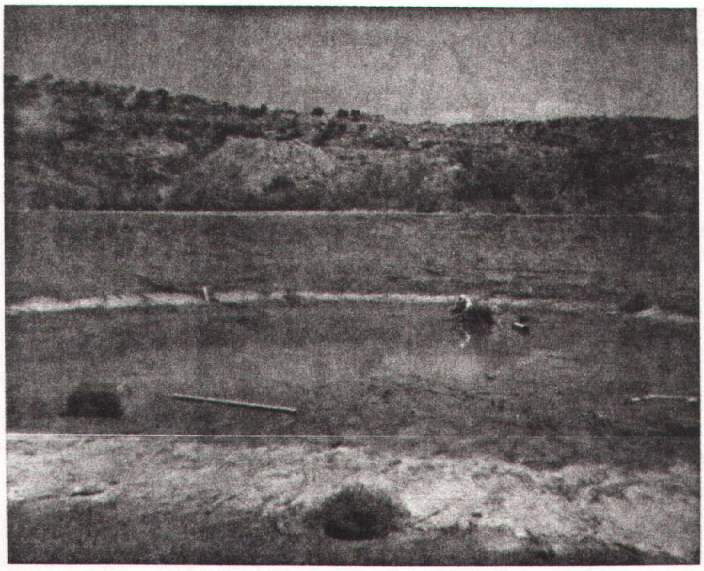
#7 Leeds Silver Reclamation Site 7/31/90
Red-brown to yellow-brown soils immediately below gray surface soils at LS-SO-03.

#8 Leeds Silver Reclamation Site 7/31/90
View south of southwest toward LS-SO-04, located near south end of tailings pile.

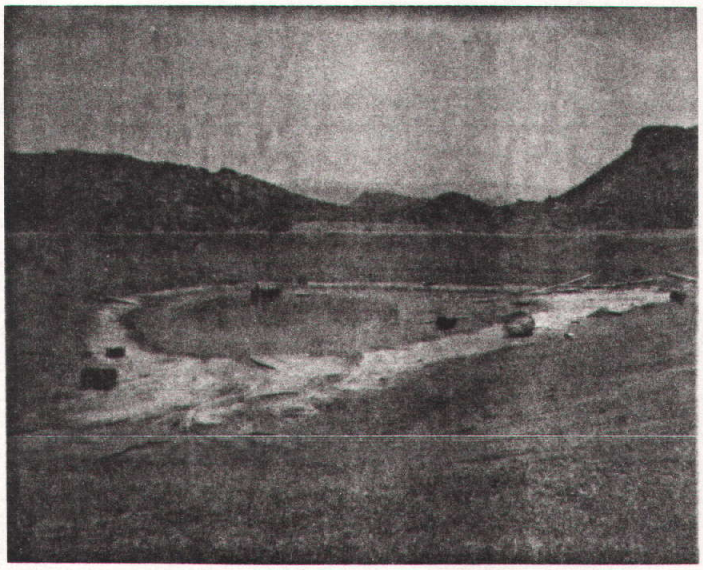
#9 Leeds Silver Reclamation Site 7/31/90
View west of northwest toward the collection pond and the location of LS-SW-01.

#10 Leeds Silver Reclamation Site 7/31/90
View northwest toward the collection pond. Sample LS-SE-01 is being collected.

#11 Leeds Silver Reclamation Site 7/31/90
View southeast toward the overflow pond and LS-SW-02.

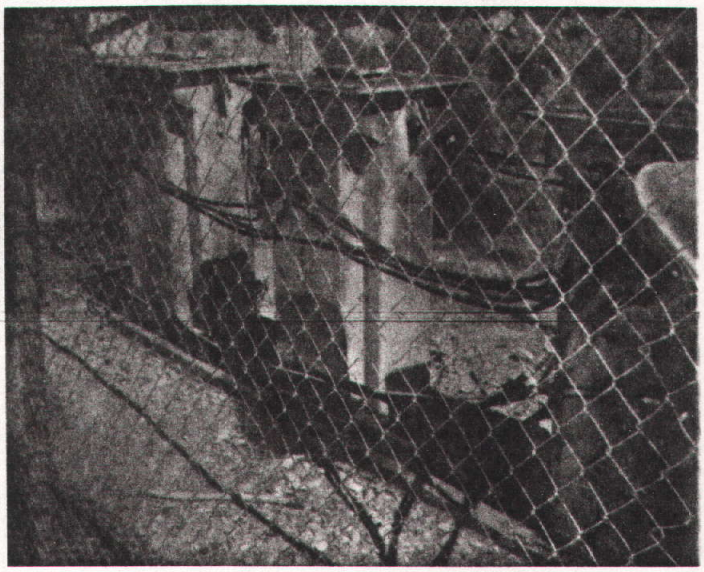


#12 Leeds Silver Reclamation Site 7/31/90
View south toward the overflow pond. Two of the drums in the photo are partially full.



#13 Leeds Silver Reclamation Site 7/31/90
View south toward the secondary impoundment. Sample LS-SE-03 was collected just beyond the trees in the middle of the photo.

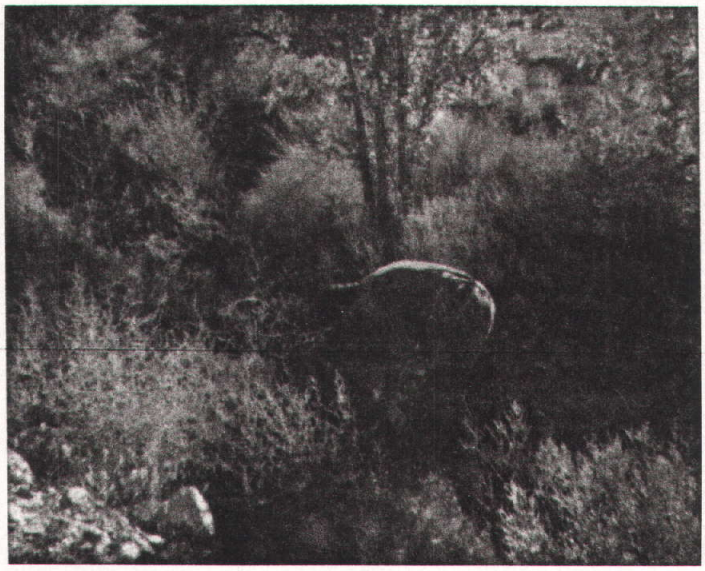
#14 Leeds Silver Reclamation Site 7/31/90
Transformers located in the south portion of the site. Note oily stains around base of center transformer.



#15 Leeds Silver Reclamation Site 8/01/90
View north to ditch and LS-SW-05. Hill in background is levee for secondary impoundment.

#16 Leeds Silver Reclamation Site 8/01/90
Ditch and location of LS-SE-05.

#17 Leeds Silver Reclamation Site 8/01/90
View north of northeast toward LS-SW-06.

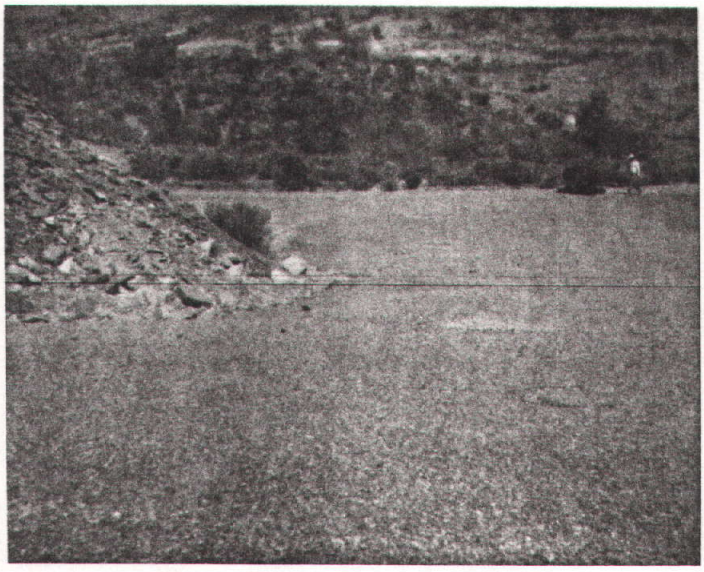


#18 Leeds Silver Reclamation Site 8/01/90
Sample collection at LS-SE-06.

#19 Leeds Silver Reclamation Site 8/01/90
View north along the east side of the tailings pile. Note sediments in road.

#20 Leeds Silver Reclamation Site 8/01/90
View south along the east side of the tailings pile. Flow characteristics are apparent in the sediments on the road.

#21 Leeds Silver Reclamation Site 8/01/90
View east from the east edge of the tailings pile and the collection pond. The on-site surface water overland flow path is east down the center of the photo.



#22 Leeds Silver Reclamation Site 8/01/90
View east of southeast. Note the flow characteristics in the sediments atop the asphalt.

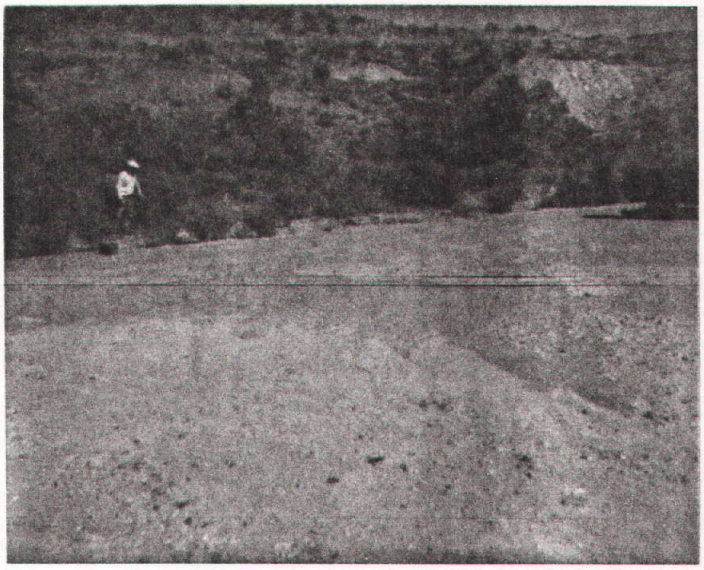


Photo-mosaic of the Leeds Silver Reclamation Site from the Northeast

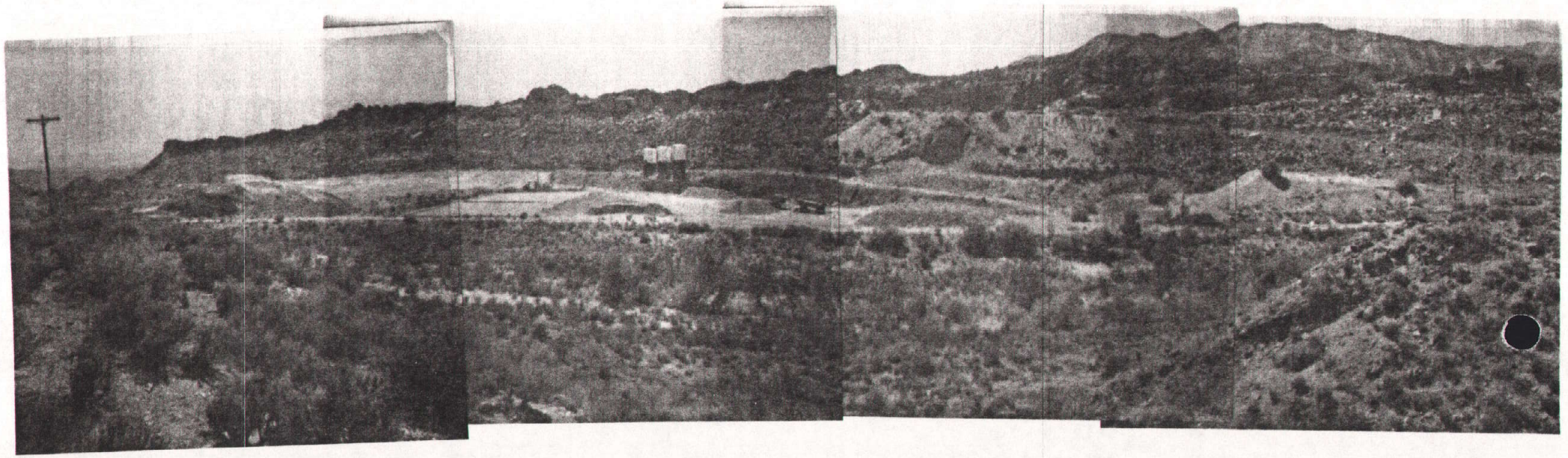
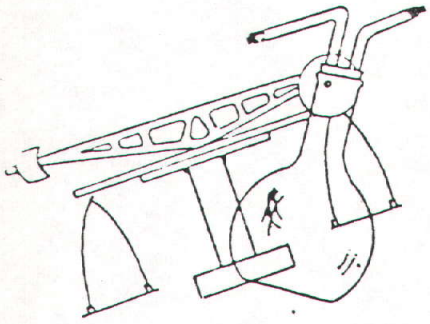


Photo-mosaic of the Leeds Silver Reclamation Site from the West



Ford Chemical LABORATORY, INC.

Bacteriological and Chemical Analysis

40 WEST LOUISE AVENUE
SALT LAKE CITY, UTAH 84115
PHONE 485-5761

Date: October 25, 1974

Name Color Country Development

Address 575 East 700 South

St. George, Utah

ATTENTION: Donald Larkin

CERTIFICATE OF ANALYSIS

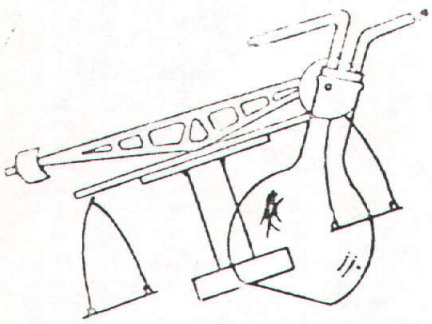
74-3943

Sample Well water from Leeds, Utah dated 10-16-74 received on October 17, 1974:

Turbidity	7.80 JTU	Fluoride as F	0.65 mg/l
Conductivity	1,002 umhos/cm	Total Hardness as $CaCO_3$	392.0 mg/
pH	8.10	Iron (Total) as Fe	0.15 mg/l
Total Dissolved Solids at 180° C.	692.0 mg/l	Iron (Filtered) as Fe	0.10 mg/l
Alkalinity as $CaCO_3$	244.0 mg/l	Lead as Pb	<0.01 mg/l
Aluminum as Al	<0.01 mg/l	Magnesium as Mg	35.52 mg/l
Arsenic as As	<0.01 mg/l	Manganese as Mn	<0.01 mg/l
Bicarbonate as HCO_3	283.60 mg/l	Mercury as Hg	<0.001 mg/l
Barium as Ba	<0.01 mg/l	Nitrate as NO_3—N	0.75 mg/l
Boron as B	<0.01 mg/l	Phosphate as PO_4	0.24 mg/l
Cadmium as Cd	<0.001 mg/l	Potassium as K	1.46 mg/l
Calcium as Ca	97.60 mg/l	Selenium as Se	<0.01 mg/l
Carbonate as CO_3	<0.01 mg/l	Silica as SiO_2	0.39 mg/l
Chloride as Cl	10.0 mg/l	Silver as Ag	<0.001 mg/l
Chromium as Cr (Hex)	<0.01 mg/l	Sulfate as SO_4	220.0 mg/l
Cyanide as Cn	<0.01 mg/l	Sodium as Na	46.0 mg/l
Copper as Cu	0.10 mg/l	Zinc as Zn	0.02 mg/l

By Ford

Ford Chemical Laboratory, Inc.



Ford Chemical LABORATORY, INC.

Bacteriological and Chemical Analysis

40 WEST LOUISE AVENUE
SALT LAKE CITY, UTAH 84115
PHONE 466-8761

DATE: 08/02/89

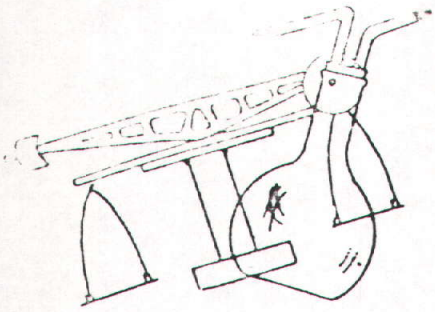
CERTIFICATE OF ANALYSIS

HIDDEN VALLEY WATER
% LAVAR WEBB
425 E. 900 SO.
ST. GEORGE, UT 84770

89-008597

SAMPLE: WATER SAMPLE RECEIVED 7-25-89 FOR COMPLETE ANALYSIS STARTING AT 1:30 P.M.

Alkalinity,CaCO3 mg/l SM403	247	Ammonia, NH3-N mg/l SM417G	<.03
Arsenic, As mg/l SM304	<.001	Barium, Ba mg/l SM303C	.06
Bicarbonate,HCO3 mg/l SM403	301	Boron as B mg/l SM 404A	.29
Cadmium, Cd mg/l SM304	<.001	Calcium, Ca mg/l SM303A	130.40
Carbonate as CO3 mg/l SM403	<.10	Chloride, Cl mg/l SM407A	43.5
Chromium Cr.Hex mg/l EPA210	<.004	Chromium,Cr Tot mg/l EPA218	<.001
Conductivity umhos/cm EPA 1	1,250	Copper, Cu mg/l SM303A	.03
Fluoride, F mg/l SM413B	.26	Hardness,CaCO3 mg/l EPA 130	593
Hydroxide as OH mg/l SM 403	<.10	Iron, Fe (Dis) mg/l SM303A	<.03
Iron, Fe (Tot) mg/l SM303A	.13	Lead, Pb mg/l SM304	<.001
Magnesium, Mg mg/l SM303A	64.10	Manganese, Mn mg/l SM303A	.36
Mercury, Hg mg/l SM320A	<.0002	Nickel, Ni mg/l SM303A	<.03
Nitrate, NO3-N mg/l SM418C	.03	Nitrite as NO2-N mg/l SM419	<.02
Phosphate PO4-P (O)EPA 365.	<.04	Potassium, K mg/l SM303A	3.53
Selenium, Se mg/l SM304	<.001	Silica SIO2 (DIS) mg/l SM42	23.24

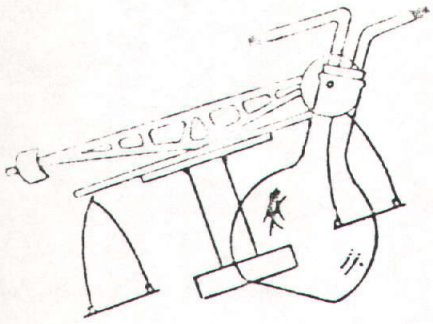


Ford Chemical
LABORATORY, INC.
Bacteriological and Chemical Analysis
40 WEST LOUISE AVENUE
SALT LAKE CITY, UTAH 84115
PHONE 466-8761

CERTIFICATE OF ANALYSIS

Silver, Ag mg/l SM304	<.001	Sodium, Na mg/l SM303A	up 55.00
Sulfate, SO4 mg/l EPA 375.2	up 380	Tot.Dis.Solids mg/l EPA 160	up 826
Turbidity NTU EPA 180.1	down .35	Zinc, Zn mg/l SM303A	up .03
pH Units EPA 420.1	7.50		

FORD CHEMICAL LABORATORY, INC.



Ford Chemical
LABORATORY, INC.
Bacteriological and Chemical Analysis
40 WEST LOUISE AVENUE
SALT LAKE CITY, UTAH 84115
PHONE 466-8761

DATE: 08/02/89

CERTIFICATE OF ANALYSIS

87-008597-01

FORD CHEMICAL LABORATORIES

BALANCE SHEET FOR SAMPLE: (1) RESULTS

C A T I O N S	mg/l	meq/l
Calcium, Ca mg/l SM303A	130.400	6.507
Magnesium, Mg mg/l SM303A	64.100	5.272
Iron, Fe (Dis) mg/l SM303A	.000	.000
Sodium, Na mg/l SM303A	55.000	2.393
Potassium, K mg/l SM303A	3.530	.090
Ammonia, NH3-N mg/l SM417G	.000	.000

A N I O N S	mg/l	meq/l
Carbonate as CO3 mg/l SM403	.000	.000
Bicarbonate,HCO3 mg/l SM403	301.000	4.936
Sulfate, SO4 mg/l EPA 375.2	380.000	7.912
Chloride, Cl mg/l SM407A	43.500	1.227
Nitrate, NO3-N mg/l SM418C	.030	.000
Hydroxide as OH mg/l SM 403	.000	.000

B A L A N C E I N F O R M A T I O N

CATIONS:	14.262
ANIONS:	14.075
TOTAL:	28.337
DIFFERENCE:	.187
SIGMA:	.006

ATTACHMENT E
Documentation

U.S. ENVIRONMENTAL PROTECTION AGENCY
Environmental Services Division

CHAIN OF CUSTODY RECORD

999 18TH. STREET
DENVER, CO. 80202-2413

PROJ. NO.

PROJECT NAME: Leeds Silver Reclamation

SAMPLERS: *(Signature)* (Jason Knowlton)

STAT. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	metals							Sample #	Tag #	REMARKS
LS-GW-01	7/30	1105		X	existing well	1	1							MHP 744	8-15809	
LS-GW-02	7/31	1120		X	trip blank	1	1							MHP 745	8-15810	
LS-SO-01	7/31	1145		X	background	1	1							MHP 746	8-15811	
LS-SO-02	7/31	1200		X	Ore Stockpile	1	1							MHP 747	8-15812	
LS-SO-03	7/31	1215		X	NE Tailing Pile	1	1							MHP 748	8-15813	
LS-SO-04	7/31	1230		X	S Tailing Pile	1	1							MHP 749	8-15814	
LS-SW-01	7/31	1400		X	Collection Pond	2	2							MHP 750	8-15815, 15816	
LS-SE-01	7/31	1400	X		Collection Pond	1	1							MHP 751	8-15817	
LS-SW-02	7/31	1430		X	Overflow Pond	1	1							MHP 752	8-15818	
LS-SE-02	7/31	1430		X	Overflow Pond	1	1							MHP 753	8-15819	
LS-SW-04	7/31	1430		X	Overflow Pond	1	1							MHP 754	8-15820	
LS-SE-04	7/31	1430		X	Overflow Pond	1	1							MHP 755	8-15821	
LS-SE-03	7/31	1530		X	Secondary Impdmt	1	1							MHP 756	8-15825	

Relinquished by: *(Signature)*	Date/Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date/Time	Received by: *(Signature)*
	8/3/90 1030				
Relinquished by: *(Signature)*	Date/Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date/Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date/Time	Received for Laboratory by: *(Signature)*	Date/Time	Remarks	

Distribution: Original Accompanies Shipment: First Copy to Coordinator Field Files: Second Copy to Representative of Inspected Facility

Split Samples: ☐ Accepted ☐ Declined Signature

R8 EPA-014B (4-21-86)

8-14605

U.S. ENVIRONMENTAL PROTECTION AGENCY
Environmental Services Division

CHAIN OF CUSTODY RECORD

REGION VIII, ONE DENVER PLACE
999 18TH. STREET
DENVER, CO. 80202-2413

PROJ. NO.	PROJECT NAME
	Leadville Silver Reclamation

SAMPLERS: *(Signature)* (Jason Knowlton)

STAT. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	metals							REMARKS: Sample #	REMARKS: Tag #
LS-SW-05	8/1/90	0800		X	downstream	1	1							MHP757	8-15826
LS-SE-05	8/1/90	0800		X	downstream	1	1							MHP758	8-15827
LS-SW-06	8/1/90	0830		X	background	1	1							MHP759	8-15828
LS-SE-06	8/1/90	0830		X	background	1	1							MHP760	8-15829

Relinquished by: *(Signature)*	Date/Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date/Time	Received by: *(Signature)*
	8/2/90 1230				
Relinquished by: *(Signature)*	Date/Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date/Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date/Time	Received for Laboratory by: *(Signature)*	Date/Time	Remarks	

Distribution: Original Accompanies Shipment: First Copy to Coordinator Field Files: Second Copy to Representative of Inspected Facility

Split Samples:
☐ Accepted ☐ Declined _____ Signature

R8 EPA-014B (4-21-86)

8-14604

USEPA CONTRACT LABORATORY PROGRAM
SAMPLE MANAGEMENT OFFICE
P.O. BOX 818 ALEXANDRIA, VA 22313
703/557-2490 FTS-557-2490

CASE NO: 14[redacted]2 | SAS NO: 5512 HG (IF APPLICABLE)

INORGANIC TRAFFIC REPORT

(FOR CLP USE ONLY)

TYPE OF ACTIVITY (CIRCLE ONE) ①
SUPERFUND—PA SI ESI RIFS RD RA ER
NPLD O&M OTHER _____
NON-SUPERFUND—_____PROGRAM

SITE NAME: Leeds Silver Reclamation
CITY, STATE: Leeds, UT
SITE SPILL ID: UTD981550619

REGION NO: 8
SAMPLING COMPANY ② Utah BERR
SAMPLER: (NAME) Jason Knowlton

SHIP TO: ③ CHEMTECH
Consulting Group
560 W 11th Street
New York, NY 10014
ATTN: Divya Mehta
212-225-2160

SAMPLING DATE: ④
BEGIN: 7/31/90 END: 8/1/90

DATE SHIPPED: 8/2/90 CARRIER: ⑤ Airborne
AIRBILL NO: _____

SAMPLE DESCRIPTION ⑥
(ENTER IN BOX A)
1. SURFACE WATER
2. GROUND WATER
3. LEACHATE
4. SOIL
5. SEDIMENT
6. OIL (SAS)
7. WASTE (SAS)

DOUBLE VOLUME REQUIRED FOR MATRIX SPIKE/DUPLICATE AQUEOUS SAMPLE

SHIP MEDIUM AND HIGH CONCENTRATION SAMPLES IN PAINT CANS

SEE REVERSE FOR ADDITIONAL INSTRUCTIONS

CLP SAMPLE NUMBER (FROM LABELS)	Ⓐ SAMPLE DESCRIPTION (FROM BOX 1) 1 2 3 4 5 6 7	Ⓑ CONCENTRATION L = LOW M = MED H = HIGH (SAS)	Ⓒ RAS ANALYSIS: TOTAL METALS	CYANIDE	DISSOLVED METALS	HIGH ONLY (SAS): SULFIDE	pH	CONDUCTIVITY	OXIDANTS	Ⓓ SPECIAL HANDLING	Ⓔ STATION LOCATION
MHP744	2	L	✓								LS-GW-01
MHP745	2	L	✓								LS-GW-02
MHP746	4	L	✓								LS-SO-01
MHP747	4	L	✓								LS-SO-02
MHP748	4	L	✓								LS-SO-03
MHP749	4	L	✓								LS-SO-04
MHP750	1	L	✓							dbl vol.	LS-SW-01
MHP751	5	L	✓								LS-SE-01
MHP752	1	L	✓								LS-SW-02
MHP753	5	L	✓								LS-SE-02
MHP754	1	L	✓								LS-SW-04
MHP755	5	L	✓								LS-SE-04
MHP756	5	L	✓								LS-SE-03
MHP757	1	L	✓								LS-SW-05
MHP758	5	L	✓								LS-SE-05
MHP759	1	L	✓								LS-SW-06
MHP760	5	L	✓								LS-SE-06

EPA Form 2075-6 (8-87)

WHITE — SMO COPY PINK — CLIENT COPY WHITE — LAB COPY FOR RETURN TO SMO YELLOW — LAB COPY

ATTACHMENT D
Ground Water Well Data

SOUTHERN UTAH STATE WATER LABORATORY
SOUTHERN UTAH STATE COLLEGE
Cedar City, Utah 84720
(801) 586-7914

INVOICE # C- 00567

RESULTS ON SAMPLE ANALYSED FOR:

LaVarr Webb

Hidden Valley Water Users
Box 801
Leeds, UT 84746

COLLECTION DATE 3-17-88 TIME COLLECTED

COLLECTOR(S) LaVarr Webb

SITE LOCATION Well #2 SAMPLE NO. K8800164

DATE RECEIVED 3-17-88 DATE RESULTS SENT 3-29-88

ANIONS mg/l		CATIONS mg/l	
42.6	CHLORIDE	.523	MANGANESE
7.7	pH	.001	MERCURY
.283	FLUORIDE	< .005	SELENIUM TOTAL
.44	NITRATE	< .005	SILVER TOTAL
106.9	SULFATE	36.0	SODIUM
CATIONS mg/l		< .05	ZINC TOTAL
< .001	ARSENIC TOTAL	**GENERAL PARAMETERS mg/l**	
< .002	CADMIUM TOTAL	< .05	SURFACTANT
< .01	CHROM TOTAL	428	TOTAL DIS. SOLIDS
.037	COPPER TOTAL	10	TURBIDITY
.07	IRON TOTAL	$125.00	TOTAL COST
< .01	LEAD TOTAL		
< .1	BARIUM TOTAL		

*These results may not be used in a court of law without written consent from Southern Utah State Testing Lab.

DRINKING WATER STANDARDS

Physical	Suggested	Maximum
Turbidity		
JTU for Treated Surface Water		1
JTU for Groundwater Sources (wells, springs, etc.)		5
Bacteriological		
Total Coliform	0/100 ml	

Chemical	Suggested Limit Mg/l	Maximum Limit Mg/l
Arsenic	0.01	0.05*
Barium		1.0*
Cadmium		0.01*
Chloride	250	
Chromium		0.05*
Copper	1.0	
Cyanide	0.01	0.2
Fluoride***		
Iron	0.3	
Lead		0.05*
Manganese	0.05	
Mercury		0.002*
Nitrate		10*
Selenium		0.01*
Silver		0.05*
Sodium	20**	
Sulfate	1000	
Total Dissolved Solids	2000	
Zinc	5	

*Limits set by EPA, National Interim Primary Drinking Water Regulations Federal Register Vol. 40, No. 248, Wednesday, December 24, 1975.

**Limit that appears to be safe for those on sodium restricted diets. This level does not pertain to normally healthy individuals as excess sodium is easily elimited from the body.

***

Average Yearly Temperature Degrees Fahrenheit	Maximum Level Milligrams Per Liter
53.7 and below	2.4
53.8 to 58.3	2.2
58.4 to 63.8	2.0
63.9 to 70.6	1.8
70.7 to 79.2	1.6
79.3 to 90.5	1.4

App. # a-6359 (81-675)

N. 4260 ft. & W 2660 ft. from the S.E. Cor. of Sec. 12, T41S., R14W., SLB&M

0-38	red shale
38-60	red sandrock
60-70	blue & gray clay
70-90	red sand rock
90-100	yellow sandrock
100-133	red + blue sand rock
133-135	white sand rock + green clay (ore)
135-145	gray & white sand rock + black soapstone
145-180	" " " " "
180-185	gray sandrock + clay
185-190	purple sandy shale
190-195	gray shale
195-200	red shale

Water level 70 ft.

145 ft. of 8 5/8" X 3/16 pipe perforated from 125 ft. to 145 ft.; 118 holes; size 1/4" X 5"

dynamited at 135 ft. with 200 lbs. of dynamite

12" hole to 142 ft.

8" hole from 142 ft. to 200 ft.

3 x purge 1010 mc =

$= \pi 6^2 (142 - 70)(12)$

$- \pi (4)^2 (200 - 142)$

$(gal/231 in^3)$

$\rightarrow = (97667 + 34967)/231$

$= 1723$ gallons

Boyd Braisham
Hurricane, Utah

PROJ. NO. | PROJECT NAME: Leeds Silver Reclamation

SAMPLERS: (Signature) (Jason Knowlton)

LT. NO.	DATE	TIME	STATION LOCATION	NO. OF CONTAINERS	Tag Numbers:	ORGANICS: WATER CHEMISTRY	METHOD 608	METHOD 624	METHOD 625	OTHER Sulfide	RADIOCHEMISTRY	MICROBIOLOGY	Sample Tag Verification	REMARKS
LS-GW-01	7/31/90	1105	existing well	1	UT 4005				✓	✓				
~~LS-GW-02~~	~~7/31~~	~~1120~~	~~trip blank~~	~~1~~	~~4006~~				~~✓~~	~~✓~~				deleted 8/2/90 -JK
LS-SO-01	7/31	1145	background	1	4007				✓	✓				
LS-SO-02	7/31	1200	Ore Stockpile	1	4008				✓	✓				
LS-SO-03	7/31	1215	NE Tailing Pile	1	4009				✓	✓				
LS-SO-04	7/31	1230	S Tailing Pile	1	4010				✓	✓				
LS-SW-01	7/31	1400	Collection Pond ✓	1	4011				✓	✓				
LS-SE-01	7/31	1400	Collection Pond	1	4012				✓	✓				
LS-SW-02	7/31	1430	Overflow Pond ✓	1	4013				✓	✓				
LS-SE-02	7/31	1430	Overflow Pond	1	4014				✓	✓				
LS-SW-04	7/31	1430	Overflow Pond ✓	1	4015				✓	✓				
LS-SE-04	7/31	1430	Overflow Pond	1	4016				✓	✓				
LS-SE-03	7/31	1530	Secondary Impdmt	1	4017				✓	✓				

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	8/2/90 13:04				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Witness: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	
		R. E. Bertoldi	8-2-90 13:04		

PROJ. NO. | PROJECT NAME: Leeds Silver Reclamation

SAMPLERS: (Signature) (Jason Knowlton)

LAT. NO.	DATE	TIME	STATION LOCATION	NO. OF CONTAINERS	Tag Numbers:	WATER CHEMISTRY	ORGANICS: METHOD 608	ORGANICS: METHOD 624	ORGANICS: METHOD 625	OTHER Sulfide	RADIOCHEMISTRY	MICROBIOLOGY	Sample Tag Verification	REMARKS
LS-SW-05	8/1/90	0800	downstream	1	VT 4018				✓	✓				9005118
LS-SE-05	8/1	0800	downstream	1	4019				✓	✓				119
LS-SW-06	8/1	0830	background	1	4020				✓	✓				9005120
LS-SE-06	8/1	0830	background	1	4021				✓	✓				121

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	8/2/90 1304				

Witness: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks
		Bri Bottorff	8-2-90 13:04	

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-GW-01 Source No. _____ Date Collected 90/07/31 (yy/mm/dd) Time Collected 1105 (24 hr clock)

Exact Description of Sampling Point: existing well

Leeds Silver Reclamation Site

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed. Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium, Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus, Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-GW-02 Source No. _____ Date Collected 90/07/31 (yy/mm/dd) Time Collected 1120 (24 hr clock)

Exact Description of Sampling Point: trip blank

Leeds Silver Reclamation Site

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium,Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus,Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-SO-01 Source No. _____ Date Collected 90/07/31 (yy/mm/dd) Time Collected 1145 (24 hr clock)

Exact Description of Sampling Point: background Leeds Silver

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed. Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium, Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus, Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-50-02 Source No. _____ Date Collected 90/07/31 (yy/mm/dd) Time Collected 1200 (24 hr clock)

Exact Description of Sampling Point: Ore Stockpile

Leeds Silver

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium, Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus, Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-50-03 Source No. _____ Date Collected 90/07/31 (yy/mm/dd) Time Collected 1215 (24 hr clock)

Exact Description of Sampling Point: NE Tailing Pile

Leeds Silver

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed. Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium, Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus, Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-50-04 Source No. _____ Date Collected 90/07/30 (yy/mm/dd) Time Collected 1230 (24 hr clock)

Exact Description of Sampling Point: S. Tailing Pile

Leeds Silver

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed. Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium,Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus,Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-SW-01 Source No. _____ Date Collected 90/07/31 (yy/mm/dd) Time Collected 1400 (24 hr clock)

Exact Description of Sampling Point: Collection Pond Leeds Silver

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium,Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus,Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-SE-01 Source No. _____ Date Collected 90/07/31 (yy/mm/dd) Time Collected 1400 (24 hr clock)

Exact Description of Sampling Point: Collection Pond

Leeds Silver

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium,Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus,Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-SW-02 Source No. _____ Date Collected 90/07/31 (yy/mm/dd) Time Collected 1430 (24 hr clock)

Exact Description of Sampling Point: Overflow Pond

Leeds Silver

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium,Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus,Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-SE-02 Source No. _____ Date Collected 90/07/31 (yy/mm/dd) Time Collected 1430 (24 hr clock)

Exact Description of Sampling Point: Overflow Pond

Leeds Silver

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed. Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium, Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus, Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓Alpha, Gross
✓Beta, Gross
___^{226}Radium
___^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-SW-04 Source No. _____ Date Collected 90/07/31 (yy/mm/dd) Time Collected 1430 (24 hr clock)

Exact Description of Sampling Point: Overflow Pond

Leeds Silver

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed. Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium, Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus, Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-SE-04 Source No. _____ Date Collected 90/07/31 (yy/mm/dd) Time Collected 1430 (24 hr clock)

Exact Description of Sampling Point: Overflow Pond

Leeds Silver

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium,Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus,Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-SE-03 Source No. _____ Date Collected 90/07/31 (yy/mm/dd) Time Collected 1530 (24 hr clock)

Exact Description of Sampling Point: Secondary Impoundment Leeds Silver

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium,Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus,Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-SW-05 Source No. _____ Date Collected 90/08/01 (yy/mm/dd) Time Collected 0800 (24 hr clock)

Exact Description of Sampling Point: downstream Leeds Silver

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium,Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus,Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-SE-05 Source No. _____ Date Collected 90/08/01 (yy/mm/dd) Time Collected 0800 (24 hr clock)

Exact Description of Sampling Point: downstream Leeds Silver

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium, Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus, Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-SW-06 Source No. _____ Date Collected 90/08/01 (yy/mm/dd) Time Collected 0830 (24 hr clock)

Exact Description of Sampling Point: background Leeds Silver

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed. Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium,Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus,Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

UTAH STATE HEALTH LABORATORY

Environmental Chemistry Water Analysis

~~Water System~~ Sample No. LS-SE-06 Source No. _____ Date Collected 90/08/01 (yy/mm/dd) Time Collected 0830 (24 hr clock)

Exact Description of Sampling Point: background Leeds Silver

Collector: Jason Knowlton County: _____ Cost Code: _____

Send Report to: Jason Knowlton, Utah Bur. of Envir. Resp. + Remed. Telephone No: 538-6170

Address: 288 N. 1460 W. S.L.C., UT 84116 Zip: _____

___TC ___PC ___TM ___PM ___BOD ___Nut ___Bact ___Pest ___THM ___Rad ___Spec

---

___BOD
___TSS
___TKN
___TOC
___COD

___Cyanide
___Phenolics
✓ Sulfide
___pH
___Oil & Grease

___MPN Total Coliforms/100 ml
___MPN Fecal Coliforms/100 ml
___MF Total Coliforms/100 ml
___MF Fecal Coliforms/100 ml
___Fecal Streptococci/100 ml
___Plate Count - Org./ml

CATIONS

___Ammonia
___Arsenic
___Barium
___Boron
___Cadmium
___Calcium
___Chromium
___Chromium, Hex
___Copper
___Iron
___Lead
___Magnesium
___Manganese
___Nickel
___Potassium
___Selenium
___Silver
___Sodium
___Zinc

ANIONS

___Bicarbonate
___Carbon Dioxide
___Carbonate
___Chloride
___CO_3 Solids
___Fluoride
___Hydroxide
___Nitrate
___Nitrite
___Phosphorus, Ortho
___Silica
___Sulfate

TOTAL METALS

___Aluminum
___Arsenic
___Barium
___Beryllium
___Cadmium
___Chromium
___Cobalt
___Copper
___Iron
___Lead
___Manganese
___Mercury
___Molybdenum
___Nickel
___Selenium
___Silver
___Vanadium
___Zinc

___Total Phosphorus
___Total Alk. as $CaCO_3$
___Total Hardness as $CaCO_3$
___Turbidity as NTU
___Sp. Cond. (umhos/cm)
___TDS @ 180°C
___Other: _____

RADIOLOGICS

✓ Alpha, Gross
✓ Beta, Gross
___ ^{226}Radium
___ ^{228}Radium
___Uranium

PROJ. NO.

PROJECT NAME: Leeds Silver Reclamation

4/24/91 - NOT YET PUBLIC KNOWLEDGE aag

SAMPLERS: (Signature) (Jason Knowlton)

LAT. NO.	DATE	TIME	STATION LOCATION	NO. OF CONTAINERS	Tag Numbers:	ORGANICS: WATER CHEMISTRY	METHOD 608	METHOD 624	METHOD 625	OTHER Sulfide	RADIOCHEMISTRY	MICROBIOLOGY	Sample Tag Verification	REMARKS
LS-GW-01	7/31/90	1105	existing well	1	UT4005				✓	✓				
~~LS-GW-02~~	~~7/31~~	~~1120~~	~~trip blank~~	~~1~~	~~4006~~				~~✓~~	~~✓~~				deleted 8/2/90 SK
LS-SO-01	7/31	1145	background	1	4007				✓	✓				
LS-SO-02	7/31	1200	Ore Stockpile	1	4008				✓	✓				
LS-SO-03	7/31	1215	NE Tailing Pile	1	4009				✓	✓				
LS-SO-04	7/31	1230	S Tailing Pile	1	4010				✓	✓				
LS-SW-01	7/31	1400	Collection Pond ✓	1	4011				✓	✓				
LS-SE-01	7/31	1400	Collection Pond	1	4012				✓	✓				
LS-SW-02	7/31	1430	Overflow Pond ✓	1	4013				✓	✓				
LS-SE-02	7/31	1430	Overflow Pond	1	4014				✓	✓				
LS-SW-04	7/31	1430	Overflow Pond ✓	1	4015				✓	✓				
LS-SE-04	7/31	1430	Overflow Pond	1	4016				✓	✓				
LS-SE-03	7/31	1530	Secondary Impdmt	1	4017				✓	✓				

DOGM MINERALS PROGRAM FILE COPY

DRAFT

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	8/2/90 13:04				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Witness: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	
		R. Bettoli	8-2-90 13:04		

PROJ. NO.

PROJECT NAME: Leeds Silver Reclamation

SAMPLERS: (Signature) Jason Knowlton (Jason Knowlton)

LAT. NO.	DATE	TIME	STATION LOCATION	NO. OF CONTAINERS	Tag Numbers:	WATER CHEMISTRY	METHOD 608	METHOD 624	METHOD 625	OTHER Sulfide	RADIOCHEMISTRY	MICROBIOLOGY	Sample Tag Verification	REMARKS
							ORGANICS							
LS-SW-05	8/1/90	0800	downstream	1	VT4018				✓	✓				9005113
LS-SE-05	8/1	0800	downstream	1	4019				✓	✓				114
LS-SW-06	8/1	0830	background	1	4020				✓	✓				9005112
LS-SE-06	8/1	0830	background	1	4021				✓	✓				115

DRAFT

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	8/2/90 1304				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Witness: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	
		Bri Bottrell	8-2-90 13:04		

COLLECTION POND(LEEDS SILVER REC.SITE)
JASON KNOWLTON/U.B.E.H.
288 N 1460 W
SALT LAKE CITY UT 84116 538-6170

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: COLLECTION POND(LEEDS SILVER REC.SITE)
Site ID: Source: 00
Cost Code: 365
Lab Number: 9005111 Type: 04
Sample Date: 90/07/31 Time: 14:00
Tot. Cations:
Tot. Anions: mg/l Cations: me/l
Grand Total: mg/l Anions: me/l

Date of Review and QA Validation
Inorganic Review: 90/09/24
Organic Review:
Radiochemistry Review: 90/09/20
Microbiology Review:

Laboratory Analyses

Sulfide	00 mg/l		Alpha, grs	2730 pc/l	+/-155.
Beta gross	5760 pc/l	+/-940.0			

Approved by:

DRAFT

OVERFLOW POND (LEEDS SILVER REC.SITE)
JASON KNOWLTON/U.B.E.H.
288 N 1460 W
SALT LAKE CITY UT 84116 538-6170

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: OVERFLOW POND (LEEDS SILVER REC.SITE)
Site ID: Source: 00
Cost Code: 365
Lab Number: 9005113 Type: 04
Sample Date: 90/07/31 Time: 14:30
Tot. Cations:
Tot. Anions: mg/l Cations: me/l
Grand Total: mg/l Anions: me/l

Date of Review and QA Validation
Inorganic Review: 90/09/24
Organic Review:
Radiochemistry Review: 90/09/20
Microbiology Review:

Laboratory Analyses

Sulfide	00 mg/l		Alpha, grs	<1 pc/l	+/-29.0
Beta gross	13 pc/l	+/-28.0			

Approved by:

DRAFT

OVERFLOW POND (LEEDS SILVER REC.SITE)
JASON KNOWLTON/U.B.E.H.
288 N 1460 W
SALT LAKE CITY UT 84116 538-6170

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: OVERFLOW POND (LEEDS SILVER REC.SITE)
Site ID: Source: 00
Cost Code: 365
Lab Number: 9005115 Type: 04
Sample Date: 90/07/31 Time: 14:30
Tot. Cations:
Tot. Anions: mg/l Cations: me/l
Grand Total: mg/l Anions: me/l

Date of Review and QA Validation
Inorganic Review: 90/09/24
Organic Review:
Radiochemistry Review: 90/09/20
Microbiology Review:

Laboratory Analyses

Sulfide	00 mg/l		Alpha, grs	53 pc/l	+/-32.0
Beta gross	67 pc/l	+/-29.0			

Approved by: J. Oman

DRAFT

DOWNSTREAM (LEEDS SILVER REC.SITE)
JASON KNOWLTON/U.B.E.H.
288 N 1460 W
SALT LAKE CITY UT 84116 538-6170

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: DOWNSTREAM (LEEDS SILVER REC.SITE)
Site ID: Source: 00
Cost Code: 365
Lab Number: 9005118 Type: 40
Sample Date: 90/08/01 Time: 08:00
Tot. Cations:
Tot. Anions: mg/l Cations: me/l
Grand Total: mg/l Anions: me/l

Date of Review and QA Validation
Inorganic Review: 90/11/09
Organic Review:
Radiochemistry Review: 90/11/09
Microbiology Review:

Laboratory Analyses

Sulfide	NO		Alpha, grs	4 pCi/g	+/-3.0
Beta gross	<1 pCi/g	+/-3.0		0	

Approved by:

DRAFT

BACKGROUND (LEEDS SILVER REC.SITE)
JASON KNOWLTON/U.B.E.H.
288 N 1460 W
SALT LAKE CITY UT 84116 538-6170

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: BACKGROUND (LEEDS SILVER REC.SITE)
Site ID: Source: 00 Date of Review and QA Validation
Cost Code: 365 Inorganic Review:
Lab Number: 9005120 Type: 04 Organic Review:
Sample Date: 90/08/01 Time: 08:30 Radiochemistry Review:
Tot. Cations: Microbiology Review:
Tot. Anions: mg/l Cations: me/l
Grand Total: mg/l Anions: me/l

Laboratory Analyses

Alpha, grs	4 pc/l	+/-3.0	Beta gross	16 pc/l	+/-4.0

Approved by: J. Oman

DRAFT

BACKGROUND (LEEDS SILVER REC.SITE)
JASON KNOWLTON/U.B.E.H.
288 N 1460 W
SALT LAKE CITY UT 84116
538-6170

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: BACKGROUND (LEEDS SILVER REC.SITE)
Site ID: Source: OO
Cost Code: 365
Lab Number: 9005107 Type: 50
Sample Date: 90/07/31 Time: 11:45
Tot. Cations:
Tot. Anions: mg/l Cations: me/l
Grand Total: mg/l Anions: me/l

Date of Review and QA Validation
Inorganic Review:
Organic Review:
Radiochemistry Review:
Microbiology Review:

Laboratory Analyses

226 Radium	1.3 pCi/g	+/-0.3

Approved by: J. Crum

DRAFT

ORE STOCKPILE (LEEDS SILVER REC.SITE)
JASON KNOWLTON/U.B.E.H.
288 N 1460 W
SALT LAKE CITY UT 84116 538-6170

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: ORE STOCKPILE (LEEDS SILVER REC.SITE)
Site ID: Source: 00 Date of Review and QA Validation
Cost Code: 365 Inorganic Review:
Lab Number: 9005108 Type: 50 Organic Review:
Sample Date: 90/07/31 Time: 12:00 Radiochemistry Review:
Tot. Cations: Microbiology Review:
Tot. Anions: mg/l Cations: me/l
Grand Total: mg/l Anions: me/l

Laboratory Analyses

226 Radium	13 pCi/g	+/-0.5

Approved by: J. Oman

DRAFT

NE TAILING PILE(LEEDS SILVER REC.SITE)
JASON KNOWLTON/U.B.E.H.
288 N 1460 W
SALT LAKE CITY UT 84116 538-6170

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: NE TAILING PILE(LEEDS SILVER REC.SITE)
Site ID: Source: OO Date of Review and QA Validation
Cost Code: 365 Inorganic Review:
Lab Number: 9005109 Type: 50 Organic Review:
Sample Date: 90/07/31 Time: 12:15 Radiochemistry Review:
Tot. Cations: Microbiology Review:
Tot. Anions: mg/l Cations: me/l
Grand Total: mg/l Anions: me/l

Laboratory Analyses

226 Radium	4.4 pCi/g	+/-0.3

Approved by: J. Oman

DRAFT

S TAILING PILE(LEEDS SILVER REC.SITE)
JASON KNOWLTON/U.B.E.H.
288 N 1460 W
SALT LAKE CITY UT 84116 538-6170

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: S TAILING PILE(LEEDS SILVER REC.SITE)
Site ID: Source: OO
Cost Code: 365
Lab Number: 9005110 Type: 50
Sample Date: 90/07/31 Time: 12:30
Tot. Cations:
Tot. Anions: mg/l Cations: me/l
Grand Total: mg/l Anions: me/l

Date of Review and QA Validation
Inorganic Review:
Organic Review:
Radiochemistry Review:
Microbiology Review:

Laboratory Analyses

226 Radium	14.4 pCi/g	+/-0.6

Approved by: J. Oman

DRAFT

COLLECTION POND(LEEDS SILVER REC.SITE)
JASON KNOWLTON/U.B.E.H.
288 N 1460 W
SALT LAKE CITY UT 84116 538-6170

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: COLLECTION POND(LEEDS SILVER REC.SITE)
Site ID: Source: 00 Date of Review and QA Validation
Cost Code: 365 Inorganic Review:
Lab Number: 9005112 Type: 40 Organic Review:
Sample Date: 90/07/31 Time: 14:00 Radiochemistry Review:
Tot. Cations: Microbiology Review:
Tot. Anions: mg/l Cations: me/l
Grand Total: mg/l Anions: me/l

Laboratory Analyses

226 Radium	4.8 pCi/g	+/-0.4

Approved by: J. Oman

DRAFT

OVERFLOW POND (LEEDS SILVER REC.SITE)
JASON KNOWLTON/U.B.E.H.
288 N 1460 W
SALT LAKE CITY UT 84116 538-6170

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: OVERFLOW POND (LEEDS SILVER REC.SITE)
Site ID: Source: 00 Date of Review and QA Validation
Cost Code: 365 Inorganic Review:
Lab Number: 9005114 Type: 50 Organic Review:
Sample Date: 90/07/31 Time: 14:30 Radiochemistry Review:
Tot. Cations: Microbiology Review:
Tot. Anions: mg/l Cations: me/l
Grand Total: mg/l Anions: me/l

Laboratory Analyses

226 Radium	3.3 pCi/g	+/-0.3

Approved by: J. Oman

DRAFT

OVERFLOW POND (LEEDS SILVER REC.SITE)
JASON KNOWLTON/U.B.E.H.
288 N 1460 W
SALT LAKE CITY UT 84116 538-6170

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: OVERFLOW POND (LEEDS SILVER REC.SITE)
Site ID: Source: 00 Date of Review and QA Validation
Cost Code: 365 Inorganic Review:
Lab Number: 9005116 Type: 50 Organic Review:
Sample Date: 90/07/31 Time: 14:30 Radiochemistry Review:
Tot. Cations: Microbiology Review:
Tot. Anions: mg/l Cations: me/l
Grand Total: mg/l Anions: me/l

Laboratory Analyses

226 Radium	2 pCi/g	+/-0.4

Approved by: J. Oman

DRAFT

SECONDARY IMPOUNDMENT (LEEDS SILVER REC.SITE)
JASON KNOWLTON/U.B.E.H.
288 N 1460 W
SALT LAKE CITY UT 84116 538-6170

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: SECONDARY IMPOUNDMENT (LEEDS SILVER REC.SITE)
Site ID: Source: 00 Date of Review and QA Validation
Cost Code: 365 Inorganic Review:
Lab Number: 9005117 Type: 50 Organic Review:
Sample Date: 90/07/31 Time: 15:30 Radiochemistry Review:
Tot. Cations: Microbiology Review:
Tot. Anions: mg/l Cations: me/l
Grand Total: mg/l Anions: me/l

Laboratory Analyses

226 Radium	1 pCi/g	+/-0.3

Approved by: J. Oman

DRAFT

DOWNSTREAM (LEEDS SILVER REC.SITE)
JASON KNOWLTON/U.B.E.H.
288 N 1460 W
SALT LAKE CITY UT 84116 538-6170

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: DOWNSTREAM (LEEDS SILVER REC.SITE)
Site ID: Source: 00 Date of Review and QA Validation
Cost Code: 365 Inorganic Review:
Lab Number: 9005119 Type: 40 Organic Review:
Sample Date: 90/08/01 Time: 08:00 Radiochemistry Review:
Tot. Cations: Microbiology Review:
Tot. Anions: mg/l Cations: me/l
Grand Total: mg/l Anions: me/l

Laboratory Analyses

226 Radium	1.4 pCi/g	+/-0.4

Approved by: J. Oman

DRAFT

BACKGROUND (LEEDS SILVER REC.SITE)
JASON KNOWLTON/U.B.E.H.
288 N 1460 W
SALT LAKE CITY UT 84116 538-6170

UTAH STATE HEALTH LABORATORY
Environmental Chemistry Analysis Report

Description: BACKGROUND (LEEDS SILVER REC.SITE)
Site ID: Source: 00 Date of Review and QA Validation
Cost Code: 365 Inorganic Review:
Lab Number: 9005121 Type: 40 Organic Review:
Sample Date: 90/08/01 Time: 08:30 Radiochemistry Review:
Tot. Cations: Microbiology Review:
Tot. Anions: mg/l Cations: me/l
Grand Total: mg/l Anions: me/l

Laboratory Analyses

226 Radium	0.9 pCi/g	+/-0.3

Approved by: J. Oman

DRAFT

U.S. ENVIRONMENTAL PROTECTION AGENCY
Environmental Services Division

4-24-91 NOT YET PUBLIC KNOWLEDGE ag

CHAIN OF CUSTODY RECORD

999 18TH. STREET
DENVER, CO. 80202-2413

DOGM MINERALS PROGRAM FILE COPY

PROJ. NO. | PROJECT NAME: Leeds Silver Reclamation

SAMPLERS: (Signature) (Jason Knowlton)

STAT. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	metals						REMARKS: Sample #	Tag #
LS-GW-01	7/30	1105		X	existing well	1	1						MHP 744	8-15809
LS-GW-02	7/31	1120		X	trip blank	1	1						MHP 745	8-15810
LS-SO-01	7/31	1145		X	background	1	1						MHP 746	8-15811
LS-SO-02	7/31	1200		X	Ore Stockpile	1	1						MHP 747	8-15812
LS-SO-03	7/31	1215		X	NE Tailing Pile	1	1						MHP 748	8-15813
LS-SO-04	7/31	1230		X	S Tailing Pile	1	1						MHP 749	8-15814
LS-SW-01	7/31	1400		X	Collection Pond	2	2						MHP 750	8-15815, 15816
LS-SE-01	7/31	1400	X		Collection Pond	1	1						MHP 751	8-15817
LS-SW-02	7/31	1430		X	Overflow Pond	1	1						MHP 752	8-15818
LS-SE-02	7/31	1430		X	Overflow Pond	1	1						MHP 753	8-15819
LS-SW-04	7/31	1430		X	Overflow Pond	1	1						MHP 754	8-15820
LS-SE-04	7/31	1430		X	Overflow Pond	1	1						MHP 755	8-15821
LS-SE-03	7/31	1530		X	Secondary Impdmt	1	1						MHP 756	8-15825

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	8/2/90 1030				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	
		Chirag Thakkar	8/03/90 10:00	00025	

Distribution: Original Accompanies Shipment: First Copy to Coordinator Field Files: Second Copy to Representative of Inspected Facility

Split Samples: ☐ Accepted ☐ Declined Signature

R8 EPA-014B (4-21-86)

951

8-14605

U.S. ENVIRONMENTAL PROTECTION AGENCY
Environmental Services Division

CHAIN OF CUSTODY RECORD

REGION VIII, ONE DENVER PLACE
999 18TH. STREET
DENVER, CO. 80202-2413

PROJ. NO.

PROJECT NAME: Leeds Silver Reclamation

SAMPLERS: (Signature) (Jason Knowlton)

STAT. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	metals						Sample Tag #	REMARKS Tag #
LS-SW-05	8/1/90	0800		X	downstream	1	1						MHP757	8-15826
LS-SE-05	8/1/90	0800		X	downstream	1	1						MHP758	8-15827
LS-SW-06	8/1/90	0830		X	background	1	1						MHP759	8-15828
LS-SE-06	8/1/90	0830		X	background	1	1						MHP760	8-15829

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	

DRAFT

Distribution: Original Accompanies Shipment: First Copy to Coordinator Field Files: Second Copy to Representative of Inspected Facility

Split Samples: ☐ Accepted ☐ Declined Signature

R8 EPA-014B (4-21-86)

8-14604

U.S. EPA - CLP

LS-GW-01

1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MHP744

ame: Chemtech Consulting Group Contract: 68-W8-0061

Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

atrix (soil/water): WATER Lab Sample ID: 00412-01S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	69.00	U	U	P
7440-36-0	Antimony	48.00	U	U	P
7440-38-2	Arsenic	[8.70]	B		F
7440-39-3	Barium	[44.00]	B		P
7440-41-7	Beryllium	[2.30]	B		P
7440-41-7	Cadmium	5.00	U	U	P
7440-70-2	Calcium	94600.00			P
7440-47-3	Chromium	9.00	U	U	P
7440-48-4	Cobalt	14.00	U	U	P
7440-50-8	Copper	21.00	U	U	P
7439-89-6	Iron	116.00			P
7439-92-1	Lead	20.00	U	UJN	F
7439-95-4	Magnesium	46000.00			P
7439-96-5	Manganese	122.00			P
7439-97-6	Mercury	0.36			CV
7440-02-0	Nickel	27.00	U	U	P
7440-09-7	Potassium	[3000.00]	B		A
7782-49-2	Selenium	30.00	U	UW	F
7440-22-4	Silver	8.00	U	UJN	P
7440-23-5	Sodium	46200.00			P
7440-28-0	Thallium	5.00	U	UW	F
7440-62-2	Vanadium	24.00	U	U	P
7440-66-6	Zinc	35.40			P
	Cyanide				NR

U = UNDETECTED
J = ESTIMATED CONCENTRATION QUALITY CONTROL CRITERIA NOT MET
[ ] = ESTIMATED CONCENTRATION THE LISTED CONCENTRATION IS BELOW THE "CONTRACT REQUIRED DETECTION LIMIT." HOWEVER, PRESENCE OF THE MATERIAL IS RELIABLE.

olor Before: COLORLESS Clarity Before: CLEAR Texture:

olor After: COLORLESS Clarity After: CLEAR Artifacts:

omments:

000003

U.S. EPA - CLP

LC-GW-02

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MHP745

Lab Name: Chemtech Consulting Group Contract: 68-W8-0061

Lab Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

Matrix (soil/water): WATER Lab Sample ID: 00412-02S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	69.00	U	U	P
7440-36-0	Antimony	48.00	U	U	P
7440-38-2	Arsenic	5.00	U	U	F
7440-39-3	Barium	29.00	U	U	P
7440-41-7	Beryllium	2.00	U	U	P
7440-41-7	Cadmium	5.00	U	U	P
7440-70-2	Calcium	870.00	U	U	P
7440-47-3	Chromium	9.00	U	U	P
7440-48-4	Cobalt	14.00	U	U	P
7440-50-8	Copper	[22.30]	B		P
7439-89-6	Iron	[63.90]	B		P
7439-92-1	Lead	2.00	U	U N	F
7439-95-4	Magnesium	[98.00]	B		P
7439-96-5	Manganese	12.00	U	U	P
7439-97-6	Mercury	2.30			CV
7440-02-0	Nickel	27.00	U	U	P
7440-09-7	Potassium	1000.00	U	U	A
7782-49-2	Selenium	3.00	U	U W	F
7440-22-4	Silver	8.00	U	U N	P
7440-23-5	Sodium	3060.00	U	U	P
7440-28-0	Thallium	5.00	U	U	F
7440-62-2	Vanadium	24.00	U	U	P
7440-66-6	Zinc	[12.20]	B		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

000004

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MHP746

Name: Chemtech Consulting Group Contract: 68-W8-0061

Lab Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

Matrix (soil/water): SOIL Lab Sample ID: 00412-03S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 97.1

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	15800.00			P
7440-36-0	Antimony	9.90	U	U	P
7440-38-2	Arsenic	2.10			F
7440-39-3	Barium	237.00			P
7440-41-7	Beryllium	[0.87]	B		P
7440-41-7	Cadmium	1.00	U	U	P
7440-70-2	Calcium	47400.00			P
7440-47-3	Chromium	11.00			P
7440-48-4	Cobalt	[3.80]	B		P
7440-50-8	Copper	11.70			P
7439-89-6	Iron	7590.00			P
7439-92-1	Lead	4.10	U	UJ N	F
7439-95-4	Magnesium	14500.00			P
7439-96-5	Manganese	480.00			P
7439-97-6	Mercury	0.96		UJ N	CV
7440-02-0	Nickel	10.00			P
7440-09-7	Potassium	3010.00		J *	A
7782-49-2	Selenium	0.62	U	U W	F
7440-22-4	Silver	1.60	U	U	P
7440-23-5	Sodium	630.00	U	U	P
7440-28-0	Thallium	1.00	U	U	F
7440-62-2	Vanadium	20.70			P
7440-66-6	Zinc	32.90			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: Artifacts:

Comments:

000005

DRAFT

U.S. EPA - CLP

LS-SO-02

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MHP747

ame: Chemtech Consulting Group Contract: 68-W8-0061

Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

atrix (soil/water): SOIL Lab Sample ID: 00412-04S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 99.7

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6310.00			P
7440-36-0	Antimony	9.60	U	U	P
7440-38-2	Arsenic	100.00	U	U S	F
7440-39-3	Barium	242.00			P
7440-41-7	Beryllium	1.10			P
7440-41-7	Cadmium	8.60			P
7440-70-2	Calcium	11900.00			P
7440-47-3	Chromium	7.80			P
7440-48-4	Cobalt	20.10			P
7440-50-8	Copper	2080.00			P
7439-89-6	Iron	8400.00			P
7439-92-1	Lead	72.40		J N	F
7439-95-4	Magnesium	7760.00			P
7439-96-5	Manganese	145.00			P
7439-97-6	Mercury	97.30		J N	CV
7440-02-0	Nickel	15.90			P
7440-09-7	Potassium	1400.00		J *	A
7782-49-2	Selenium	7.10			F
7440-22-4	Silver	61.00			P
7440-23-5	Sodium	614.00	U	U	P
7440-28-0	Thallium	1.00	U	U W	F
7440-62-2	Vanadium	202.00			P
7440-66-6	Zinc	615.00			P
_____	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: Artifacts:

Comments:

000066

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MHP748

Name: Chemtech Consulting Group Contract: 68-W8-0061

Lab Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

Matrix (soil/water): SOIL Lab Sample ID: 00412-05S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 97.7

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11900.00			P
7440-36-0	Antimony	9.80	U	U	P
7440-38-2	Arsenic	8.40			F
7440-39-3	Barium	133.00			P
7440-41-7	Beryllium	[1.00]	B		P
7440-41-7	Cadmium	1.00	U	U	P
7440-70-2	Calcium	6760.00			P
7440-47-3	Chromium	12.00			P
7440-48-4	Cobalt	[4.10]	B		P
7440-50-8	Copper	225.00			P
7439-89-6	Iron	11800.00			P
7439-92-1	Lead	7.40		J N	F
7439-95-4	Magnesium	8350.00			P
7439-96-5	Manganese	70.40			P
7439-97-6	Mercury	1.80		J N	CV
7440-02-0	Nickel	[7.30]	B		P
7440-09-7	Potassium	1940.00		J *	A
7782-49-2	Selenium	16.80			F
7440-22-4	Silver	7.00			P
7440-23-5	Sodium	2340.00			P
7440-28-0	Thallium	1.00	U	U W	F
7440-62-2	Vanadium	182.00			P
7440-66-6	Zinc	40.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: Artifacts:

Comments:

000067

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U.S. EPA - CLP

1-30-94

1
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MHP749

Name: Chemtech Consulting Group Contract: 68-W8-0061

Lab Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

Matrix (soil/water): SOIL Lab Sample ID: 00412-06S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 93.5

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	19300.00			P
7440-36-0	Antimony	10.30	U	U	P
7440-38-2	Arsenic	24.90		S	F
7440-39-3	Barium	308.00			P
7440-41-7	Beryllium	1.70			P
7440-41-7	Cadmium	1.10	U	U	P
7440-70-2	Calcium	11900.00			P
7440-47-3	Chromium	16.40			P
7440-48-4	Cobalt	3.00	U	U	P
7440-50-8	Copper	698.00			P
7439-89-6	Iron	14200.00			P
7439-92-1	Lead	43.00		J N	F
7439-95-4	Magnesium	9190.00			P
7439-96-5	Manganese	65.70			P
7439-97-6	Mercury	0.76		J N	CV
7440-02-0	Nickel	[6.60]	B		P
7440-09-7	Potassium	3040.00	B	J *	A
7782-49-2	Selenium	10.20			F
7440-22-4	Silver	7.60			P
7440-23-5	Sodium	6460.00			P
7440-28-0	Thallium	1.10	U	U	F
7440-62-2	Vanadium	263.00			P
7440-66-6	Zinc	35.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: Artifacts:

Comments:

000006

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MHP750

Name: Chemtech Consulting Group Contract: 68-W8-0061

Lab Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

Matrix (soil/water): WATER Lab Sample ID: 00412-07S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	951000.00			P
7440-36-0	Antimony	156.00			P
7440-38-2	Arsenic	500.00	U	U W	F
7440-39-3	Barium	5800.00	U	U	P
7440-41-7	Beryllium	48.30			P
7440-41-7	Cadmium	821.00			P
7440-70-2	Calcium	141000.00			P
7440-47-3	Chromium	82.80			P
7440-48-4	Cobalt	2040.00			P
7440-50-8	Copper	883000.00			P
7439-89-6	Iron	12000.00			P
7439-92-1	Lead	200.00	U	UJ NE	F
7439-95-4	Magnesium	20200000.00			P
7439-96-5	Manganese	165000.00			P
7439-97-6	Mercury	1.10			CV
7440-02-0	Nickel	1050.00			P
7440-09-7	Potassium	8700.00			A
7782-49-2	Selenium	810.00			F
7440-22-4	Silver	14100.00		J N	P
7440-23-5	Sodium	53700000.00			P
7440-28-0	Thallium	[84.00]	B	E	F
7440-62-2	Vanadium	609.00			P
7440-66-6	Zinc	205000.00			P
	Cyanide				NR

Color Before: GREEN Clarity Before: CLEAR Texture:

Color After: GREEN Clarity After: CLEAR Artifacts:

Comments:

000069

DRAFT

U.S. EPA - CLP

LS-SE-01

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MHP751

Name: Chemtech Consulting Group Contract: 68-W8-0061

Lab Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

Matrix (soil/water): SOIL Lab Sample ID: 00412-08S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 86.1 Eld. Pond Sample Suite

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7660.00		mg/kg	P
7440-36-0	Antimony	11.10	U	U	P
7440-38-2	Arsenic	11.40			F
7440-39-3	Barium	86.90			P
7440-41-7	Beryllium	[0.69]	B		P
7440-41-7	Cadmium	3.80			P
7440-70-2	Calcium	16000.00			P
7440-47-3	Chromium	6.10			P
7440-48-4	Cobalt	[6.20]	B		P
7440-50-8	Copper	688.00			P
7439-89-6	Iron	4530.00			P
7439-92-1	Lead	11.60		J N	F
7439-95-4	Magnesium	9560.00			P
7439-96-5	Manganese	198.00			P
7439-97-6	Mercury	1.20		J N	CV
7440-02-0	Nickel	6.30	U	U	P
7440-09-7	Potassium	1790.00		J *	A
7782-49-2	Selenium	3.40			F
7440-22-4	Silver	56.90			P
7440-23-5	Sodium	110000.00			P
7440-28-0	Thallium	1.20	U	U	F
7440-62-2	Vanadium	82.50			P
7440-66-6	Zinc	101.00			P
	Cyanide				NR

mg/kg = ppm

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: Artifacts:

Comments:

000010

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MHP752

Name: Chemtech Consulting Group Contract: 68-W8-0061

Lab Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

Matrix (soil/water): WATER Lab Sample ID: 00412-09S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	570.00			P
7440-36-0	Antimony	4800.00	U	U	P
7440-38-2	Arsenic	5.00	U	U W	F
7440-39-3	Barium	2900.00	U	U	P
7440-41-7	Beryllium	200.00	U	U	P
7440-41-7	Cadmium	9.10			P
7440-70-2	Calcium	652000.00			P
7440-47-3	Chromium	900.00	U	U	P
7440-48-4	Cobalt	1400.00	U	U	P
7440-50-8	Copper	356.00			P
7439-89-6	Iron	256.00			P
7439-92-1	Lead	20.00	U	J NE	F
7439-95-4	Magnesium	252000.00			P
7439-96-5	Manganese	4570.00			P
7439-97-6	Mercury	4.70			CV
7440-02-0	Nickel	2700.00	U	U	P
7440-09-7	Potassium	10100.00			A
7782-49-2	Selenium	30.00	U	U W	F
7440-22-4	Silver	76.10		J N	P
7440-23-5	Sodium	1860000.00			P
7440-28-0	Thallium	50.00	U	U W	F
7440-62-2	Vanadium	2400.00	U	U	P
7440-66-6	Zinc	68.10			P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

000011

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U.S. EPA - CLP

LC-SE-02

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MHP753

Lab Name: Chemtech Consulting Group Contract: 68-W8-0061

Lab Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

Matrix (soil/water): SOIL Lab Sample ID: 00412-10S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 73.1

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9540.00			P
7440-36-0	Antimony	13.10	U	U	P
7440-38-2	Arsenic	40.20			F
7440-39-3	Barium	143.00			P
7440-41-7	Beryllium	[1.20]	B		P
7440-41-7	Cadmium	1.40	U	U	P
7440-70-2	Calcium	19900.00			P
7440-47-3	Chromium	19.20			P
7440-48-4	Cobalt	3.80	U	U	P
7440-50-8	Copper	1010.00			P
7439-89-6	Iron	52500.00			P
7439-92-1	Lead	202.00		J N	F
7439-95-4	Magnesium	3260.00			P
7439-96-5	Manganese	58.20			P
7439-97-6	Mercury	4.40		J N	CV
7440-02-0	Nickel	7.40	U	U	P
7440-09-7	Potassium	3560.00		J *	A
7782-49-2	Selenium	3.00			F
7440-22-4	Silver	8.30			P
7440-23-5	Sodium	7010.00			P
7440-28-0	Thallium	1.40	U	U W	F
7440-62-2	Vanadium	132.00			P
7440-66-6	Zinc	54.60			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

000012

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U.S. EPA - CLP

LS-SW-04

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MHP754

Lab Name: Chemtech Consulting Group Contract: 68-W8-0061

Lab Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

Matrix (soil/water): WATER Lab Sample ID: 00412-11S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	286.00			P
7440-36-0	Antimony	4800.00	U	U	P
7440-38-2	Arsenic	5.00	U	U W	F
7440-39-3	Barium	2900.00	U	U	P
7440-41-7	Beryllium	200.00	U	U	P
7440-41-7	Cadmium	500.00	U	U	P
7440-70-2	Calcium	661000.00			P
7440-47-3	Chromium	[9.10]	B		P
7440-48-4	Cobalt	1400.00	U	U	P
7440-50-8	Copper	253.00			P
7439-89-6	Iron	234.00			P
7439-92-1	Lead	20.00	U	U NE	F
7439-95-4	Magnesium	251000.00			P
7439-96-5	Manganese	4500.00			P
7439-97-6	Mercury	1.40			CV
7440-02-0	Nickel	2700.00	U	U	P
7440-09-7	Potassium	10300.00			A
7782-49-2	Selenium	30.00	U	U W	F
7440-22-4	Silver	73.40		J N	P
7440-23-5	Sodium	1860000.00			P
7440-28-0	Thallium	50.00	U	U W	F
7440-62-2	Vanadium	2400.00	U	U	P
7440-66-6	Zinc	[19.10]	B		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

000013

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U.S. EPA - CLP

LS-SE-04

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MHP755

Lab Name: Chemtech Consulting Group Contract: 68-W8-0061

Lab Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

Matrix (soil/water): SOIL Lab Sample ID: 00412-12S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 73.4

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11800.00			P
7440-36-0	Antimony	13.10	U	U	P
7440-38-2	Arsenic	32.20			F
7440-39-3	Barium	173.00			P
7440-41-7	Beryllium	1.70			P
7440-41-7	Cadmium	1.40	U	U	P
7440-70-2	Calcium	20900.00			P
7440-47-3	Chromium	19.30			P
7440-48-4	Cobalt	[4.50]	B		P
7440-50-8	Copper	1210.00			P
7439-89-6	Iron	39600.00			P
7439-92-1	Lead	85.00		J N	F
7439-95-4	Magnesium	4370.00			P
7439-96-5	Manganese	96.70			P
7439-97-6	Mercury	5.40		J N	CV
7440-02-0	Nickel	[9.90]	B		P
7440-09-7	Potassium	3300.00		J *	A
7782-49-2	Selenium	2.60			F
7440-22-4	Silver	8.20			P
7440-23-5	Sodium	5730.00			P
7440-28-0	Thallium	1.40	U	U W	F
7440-62-2	Vanadium	149.00			P
7440-66-6	Zinc	88.10			P
	Cyanide				NR

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

000014

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U.S. EPA - CLP

2-SE-03

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MHP756

Lab Name: Chemtech Consulting Group Contract: 68-W8-0061

Lab Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

Matrix (soil/water): SOIL Lab Sample ID: 00412-13S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 87.5

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	25200.00			P
7440-36-0	Antimony	11.00	U	U	P
7440-38-2	Arsenic	13.60			F
7440-39-3	Barium	146.00			P
7440-41-7	Beryllium	1.60			P
7440-41-7	Cadmium	1.40			P
7440-70-2	Calcium	58400.00			P
7440-47-3	Chromium	17.20			P
7440-48-4	Cobalt	13.60			P
7440-50-8	Copper	1680.00			P
7439-89-6	Iron	21300.00			P
7439-92-1	Lead	48.00		J N	F
7439-95-4	Magnesium	26100.00			P
7439-96-5	Manganese	451.00			P
7439-97-6	Mercury	2.80		J N	CV
7440-02-0	Nickel	23.10			P
7440-09-7	Potassium	9490.00		J *	A
7782-49-2	Selenium	1.40			F
7440-22-4	Silver	5.70			P
7440-23-5	Sodium	16000.00			P
7440-28-0	Thallium	1.10	U	U W	F
7440-62-2	Vanadium	49.70			P
7440-66-6	Zinc	621.00			P
	Cyanide				NR

Color Before: RED Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: Artifacts:

Comments:

000015

U.S. EPA - CLP

5-541-05

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MHP757

Lab Name: Chemtech Consulting Group Contract: 68-W8-0061

Lab Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

Matrix (soil/water): WATER Lab Sample ID: 00412-14S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	518.00			P
7440-36-0	Antimony	48.00	U	U	P
7440-38-2	Arsenic	5.00	U	U W	F
7440-39-3	Barium	[41.60]	B		P
7440-41-7	Beryllium	2.00	U	U	P
7440-41-7	Cadmium	5.00	U	U	P
7440-70-2	Calcium	34700.00			P
7440-47-3	Chromium	9.00	U	U	P
7440-48-4	Cobalt	14.00	U	U	P
7440-50-8	Copper	[21.10]	B		P
7439-89-6	Iron	339.00			P
7439-92-1	Lead	2.00	U	U N	F
7439-95-4	Magnesium	9450.00			P
7439-96-5	Manganese	[14.90]	B		P
7439-97-6	Mercury	0.57			CV
7440-02-0	Nickel	27.00	U	U	P
7440-09-7	Potassium	1000.00	U	U	A
7782-49-2	Selenium	3.00	U	U	F
7440-22-4	Silver	8.00	U	U N	P
7440-23-5	Sodium	5690.00			P
7440-28-0	Thallium	5.00	U	U W	F
7440-62-2	Vanadium	24.00	U	U	P
7440-66-6	Zinc	22.30			P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

000616

DRAFT

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

-S-SE-05

EPA SAMPLE NO.

MHP758

Name: Chemtech Consulting Group Contract: 68-W8-0061

Lab Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

Matrix (soil/water): SOIL Lab Sample ID: 00412-15S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 79.1

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	23900.00			P
7440-36-0	Antimony	12.10	U	U	P
7440-38-2	Arsenic	6.90			F
7440-39-3	Barium	132.00			P
7440-41-7	Beryllium	1.40			P
7440-41-7	Cadmium	1.30	U	U	P
7440-70-2	Calcium	72600.00			P
7440-47-3	Chromium	11.60			P
7440-48-4	Cobalt	[6.40]	B		P
7440-50-8	Copper	58.40			P
7439-89-6	Iron	17700.00			P
7439-92-1	Lead	5.10	U	UJNW	F
7439-95-4	Magnesium	24400.00			P
7439-96-5	Manganese	453.00			P
7439-97-6	Mercury	1.90		J N	CV
7440-02-0	Nickel	13.70			P
7440-09-7	Potassium	11100.00		J *	A
7782-49-2	Selenium	0.76	U	U W	F
7440-22-4	Silver	2.00	U	U	P
7440-23-5	Sodium	774.00	U	U	P
7440-28-0	Thallium	1.30	U	U W	F
7440-62-2	Vanadium	36.50			P
7440-66-6	Zinc	72.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: Artifacts:

Comments:

000017

DRAFT

LC-SW-06

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MHP759

Lab Name: Chemtech Consulting Group Contract: 68-W8-0061

Lab Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

Matrix (soil/water): WATER Lab Sample ID: 00412-16S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	200.00			P
7440-36-0	Antimony	48.00	U	U	P
7440-38-2	Arsenic	5.00	U	U	F
7440-39-3	Barium	[42.90]	B		P
7440-41-7	Beryllium	2.00	U	U	P
7440-41-7	Cadmium	5.00	U	U	P
7440-70-2	Calcium	33900.00			P
7440-47-3	Chromium	9.00	U	U	P
7440-48-4	Cobalt	14.00	U	U	P
7440-50-8	Copper	21.00	U	U	P
7439-89-6	Iron	141.00			P
7439-92-1	Lead	2.00	U	U N	F
7439-95-4	Magnesium	9150.00			P
7439-96-5	Manganese	12.00	U	U	P
7439-97-6	Mercury	0.36			CV
7440-02-0	Nickel	27.00	U	U	P
7440-09-7	Potassium	1000.00	U	U	A
7782-49-2	Selenium	3.00	U	U W	F
7440-22-4	Silver	8.00	U	U N	P
7440-23-5	Sodium	5760.00			P
7440-28-0	Thallium	5.00	U	U W	F
7440-62-2	Vanadium	24.00	U	U	P
7440-66-6	Zinc	11.00	U	U	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

000016

DRAFT

U.S. EPA - CLP

LS-SE-06

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MHP760

Lab Name: Chemtech Consulting Group Contract: 68-W8-0061

Lab Code: CHEM Case No.: 14662 SAS No.: 5512HQ SDG No.: MHP744

Matrix (soil/water): SOIL Lab Sample ID: 00412-17S

Level (low/med): LOW Date Received: 08/03/90

% Solids: 78.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6610.00			P
7440-36-0	Antimony	12.20	U	U	P
7440-38-2	Arsenic	[2.40]	B		F
7440-39-3	Barium	81.30			P
7440-41-7	Beryllium	[0.70]	B		P
7440-41-7	Cadmium	1.30	U	U	P
7440-70-2	Calcium	31000.00			P
7440-47-3	Chromium	8.80			P
7440-48-4	Cobalt	[6.60]	B		P
7440-50-8	Copper	33.00			P
7439-89-6	Iron	10900.00			P
7439-92-1	Lead	5.10	U	UJN	F
7439-95-4	Magnesium	5220.00			P
7439-96-5	Manganese	195.00			P
7439-97-6	Mercury	2.60		J N	CV
7440-02-0	Nickel	10.40			P
7440-09-7	Potassium	1960.00		J *	A
7782-49-2	Selenium	0.76	U	U W	F
7440-22-4	Silver	2.00	U	U	P
7440-23-5	Sodium	779.00	U	U	P
7440-28-0	Thallium	1.30	U	U W	F
7440-62-2	Vanadium	33.40			P
7440-66-6	Zinc	37.60			P
	Cyanide				NR

Color Before: GRAY Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: Artifacts:

Comments:

CC0619